# Attachment A

Flow Frequency Memo, VIMS Mixing Study

# MEMORANDUM

**DEPARTMENT OF ENVIRONMENTAL QUALITY**
**Piedmont Regional Office**
**4949-A Cox Road Glen Allen, Virginia 23060**

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**SUBJECT:** Flow Frequency Determination / 303(d) Status
Surry Power Station – VA0004090

**TO:** Jeremy Kazio

**FROM:** Jennifer Palmore, P.G.

**DATE:** June 27, 2012
**REVISED:** October 3, 2012

**COPIES:** File

The Dominion Virginia Power's Surry Power Station is located on Gravel Neck in Surry County, VA. Flow frequencies have been requested for use in developing effluent limitations for the VPDES permit.

**Outfall 001**

Outfall 001 discharges to the James River at rivermile 2-JMS037.30. The James River is tidally influenced at the discharge location. Flow frequencies cannot be determined for tidal waters; therefore the dilution ratios from the 1995 study "Mixing and Dilution of the Surry Nuclear Power Plant Cooling Water Discharge into the James River" should be used.

At the discharge point, the Virginia Water Quality Standards designates the James River as transitional water; therefore the more stringent of each of the freshwater and saltwater criteria should be applied. The area is considered Migratory Spawning and Nursery habitat.

During the 2010 305(b)/303(d) Integrated Water Quality Assessment, the James River was considered a Category 5A water ("A Water Quality Standard is not attained. The water is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL (303d list).") The applicable fact sheets are attached. The Aquatic Life Use is impaired due to excessive chlorophyll *a*, inadequate benthic community, and past dissolved oxygen exceedances. The Fish Consumption Use is impaired due to a VDH advisory for PCBs; in addition, kepone is considered a non-impairing observed effect. The Recreation Use was fully supporting and the Wildlife Use was not assessed.

In the draft 2012 Water Quality Assessment, the river was assessed as Category 5D. The applicable fact sheets are attached. The Aquatic Life Use is impaired due to excessive chlorophyll *a*, inadequate benthic community, and past dissolved oxygen exceedances. The Fish Consumption Use is impaired due to a VDH advisory for PCBs; in addition, kepone is considered a non-impairing observed effect. The Recreation Use was fully supporting and the Wildlife Use was not assessed.

Field data from water quality monitoring station 2-JMS041.27 is attached. The station is located at the Scotland Ferry pier approximately 3.97 miles upstream of the discharge. However, hardness data was not collected at this station; therefore hardness from station 2-JMS050.57 was used. The station is located at buoy 66 above the confluence with the Chickahominy River and is 13.27 miles upstream of the discharge.

The James River had previously been considered a Tier 2 water at the discharge point. However, due to the benthic impairment in the oligohaline mainstem segment, the James should be designated a Tier 1 waterbody.

**Outfall 002 / Outfall 050**

Outfalls 002 and 050 discharge to an unnamed tributary of the James River in the Hog Island State Wildlife Management Area at rivermile 2-XTD002.15 and 2-XTD001.80, respectively. The USGS Hog Island 7 ½' topographic quadrangle shows the receiving stream as intermittent. The flow frequencies for intermittent streams are listed below:

**Outfall 002:**

| | |
|---|---|
| 1Q30 = 0.00 cfs | High Flow 1Q10 = 0.0 cfs |
| 1Q10 = 0.0 cfs | High Flow 7Q10 = 0.0 cfs |
| 7Q10 = 0.0 cfs | High Flow 30Q10 = 0.0 cfs |
| 30Q10 = 0.0 cfs | HM = 0.0 cfs |
| 30Q5 = 0.0 cfs | Annual Average = 0.0 cfs |

During the 2010 305(b)/303(d) and draft 2012 Assessments, the unnamed tributary was not assessed for any Designated Use. It is therefore considered a Category 3A water.

Due to its intermittent nature, the receiving stream should be considered a Tier 1 water. Effluent data should be used to characterize the stream during low-flow conditions.

**Outfall 051**

Outfall 051 discharges to an unnamed tributary of Hog Island Creek at rivermile 2CXBO000.42. The stream is shown as an intermittent and is therefore considered a Tier 1 waterbody. The stream was not assessed in the 2010 or draft 2012 Water Quality Assessment (Category 3A).

**Outfall 052**

The outfall discharges to the James River at rivermile 2-JMS029.34. The James River was considered Category 5A in the 2010 305(b) cycle and Category 5D in the draft 2012 report. The applicable fact sheets are attached. The Aquatic Life Use is impaired due to excessive chlorophyll *a*, inadequate benthic community, and past dissolved oxygen exceedances. The Fish Consumption Use is impaired due to a VDH advisory for PCBs; in addition, kepone is considered a non-impairing observed effect. The Recreation Use and Shellfish Uses were fully supporting and the Wildlife Use was not assessed.

**Outfall 053**

Stormwater outfall 052 discharges to the mesohaline James River at rivermile 2-JMS029.27. The James River was considered Category 5A in the 2010 305(b) cycle and Category 5D in the draft 2012 report. The applicable fact sheets are attached. The Aquatic Life Use is impaired due to excessive chlorophyll *a* and dissolved oxygen exceedances during the summer period in segment JMSMH. The Fish Consumption Use is impaired due to a VDH advisory for PCBs; in addition, kepone is considered a non-impairing observed effect. The Recreation Use and Shellfish Uses were fully supporting and the Wildlife Use was not assessed.

**TMDL**

The facility was addressed in the Chesapeake Bay TMDL, which was approved by the EPA on 12/29/2010. The TMDL allocates loads for total nitrogen, total phosphorus, and total suspended solids to protect the dissolved oxygen and submerged aquatic vegetation acreage criteria in the Chesapeake Bay and its tidal tributaries. The Surry Power Plant discharge was included in the aggregated loads for non-significant wastewater dischargers in the oligohaline James River estuary (JMSOH). The stormwater outfall discharge to the mesohaline James River estuary (JMSMH) was not addressed. The nutrient allocations are administered through the Watershed Nutrient General Permit; the TSS allocations are considered aggregated and facilities with technology-based TSS limits are considered to be in conformance with the TMDL.

If you have any questions concerning this analysis or need additional information, please let me know.

# 2010 Fact Sheets for 303(d) Waters

**RIVER BASIN:** James River Basin

**HYDROLOGIC UNIT:** 02080206

**STREAM NAME:** **James River Oligohaline Estuary**

**TMDL ID:** **JMSOH-DO-BAY**

**2010 IMPAIRED AREA ID:** CB-JMSOH

**ASSESSMENT CATEGORY:** 5A/3B

**TMDL DUE DATE:** 2010

**IMPAIRED SIZE:** 48.7295 - Sq. Mi.

**Watershed:** VAP-G03E

**INITIAL LISTING:** 1998

**UPSTREAM LIMIT:** Tidal Freshwater/Oligohaline Boundary

**DOWNSTREAM LIMIT:** Oligohaline/Mesohaline Boundary

The James River Oligohaline Estuary.

**CLEAN WATER ACT GOAL AND USE SUPPORT:**

Aquatic Life Use - Not Supporting, Open Water Subuse - Insufficient Information

**IMPAIRMENT:** Dissolved Oxygen

The mainstem James River from the Appomattox River to the Chickahominy River was originally listed on the 1998 list as fully supporting but threatened of the Aquatic Life Use goal based on chlorophyll_ a exceedances. During the 1998 cycle, EPA extended the segment upstream to the fall line and downgraded the river to not supporting the Aquatic Life Use, citing nutrient concerns.

In previous cycles, the mainstem James River had acceptable dissolved oxygen levels.

During the 2006 cycle, the CB water quality standards were implemented. The entire Oligohaline James River estuary failed the 30-day Open Water summer dissolved oxygen criteria.

However, during the 2010 cycle, the segment passed all DO criteria which could be assessed. The mainstem James River will remain impaired for the Aquatic Life Uses since it is an EPA overlisted water. The tributaries will be delisted (partial).

**IMPAIRMENT SOURCE:** Nonpoint Source, Point Source

The tributary strategy for the James River assigned sources and allocations.

**RECOMMENDATION:** Problem Characterization / Partial Delist

# 2010 Fact Sheets for 303(d) Waters

**RIVER BASIN:** James River Basin

**HYDROLOGIC UNIT:** 02080206

**STREAM NAME:** **James River**

**TMDL ID:** **G04E-04-CHLA**

**2010 IMPAIRED AREA ID:** CB-JMSOH

**ASSESSMENT CATEGORY:** 5A

**TMDL DUE DATE:** 2010

**IMPAIRED SIZE:** 46.539 - Sq. Mi.

**Watershed:** VAP-G04E

**INITIAL LISTING:** 2008

**UPSTREAM LIMIT:** Tidal Freshwater/Oligohaline boundary

**DOWNSTREAM LIMIT:** Oligohaline/Mesohaline boundary

The mainstem of the James River within the Oligohaline Estuary.

**CLEAN WATER ACT GOAL AND USE SUPPORT:**

Aquatic Life Use - Not Supporting, Open Water Subuse - Not Supporting

**IMPAIRMENT:** Chlorophyll

The James River from the Appomattox River to the Chickahominy River was originally listed on the 1998 list as fully supporting but threatened of the Aquatic Life Use goal based on chlorophyll_a exceedances. During the 1998 cycle, EPA extended the segment upstream to the fall line and downgraded the river to not supporting the Aquatic Life Use, citing nutrient concerns.

A special site-specific chlorophyll standard for the mainstem James River was adopted during the 2008 cycle. The oligohaline segment exceeds the spring seasonal mean.

**IMPAIRMENT SOURCE:** Point sources, Nonpoint Sources

The James River Tributary Strategy was developed to bring the river into attainment.

**RECOMMENDATION:** Problem Characterization

# 2010 Fact Sheets for 303(d) Waters

**RIVER BASIN:** James River Basin

**HYDROLOGIC UNIT:** 02080206

**STREAM NAME:** **James River and Various Tributaries**

**TMDL ID:** **G01E-03-PCB**

**2010 IMPAIRED AREA ID:** CB-JMSTFU

**ASSESSMENT CATEGORY:** 5A

**TMDL DUE DATE:** 2014

**IMPAIRED SIZE:** ~325 - Stream mile

**Watershed:** VAP-G01E

**INITIAL LISTING:** 2002

**UPSTREAM LIMIT:** Fall line

**DOWNSTREAM LIMIT:** Hampton Roads Bridge Tunnel

Estuarine James River from the fall line to the Hampton Roads Bridge Tunnel, including several tributaries listed below.

**CLEAN WATER ACT GOAL AND USE SUPPORT:**

Fish Consumption Use - Not Supporting

**IMPAIRMENT:** Fish Tissue - PCBs, VDH Fish Consumption Restriction

During the 2002 cycle, the James River from the Fall line to Queens Creek was considered not supporting of the Fish Consumption Use due to PCBs in multiple fish species at multiple DEQ monitoring locations.

During the 2004 cycle, a VDH Fish Consumption Restriction was issued from the fall line to Flowerdew Hundred and the segment was adjusted slightly to match the Restriction. In addition, in the 2004 cycle, the Chickahominy River from Walkers Dam to Diascund Creek was assessed as not supporting the Fish Consumption Use because the DEQ screening value for PCBs was exceeded in 3 species during sampling in 2001.

During the 2006 cycle, the VDH restriction was extended on 12/13/2004 to extend from the I-95 bridge downstream to the Hampton Roads Bridge Tunnel and include the tidal portions of the following tributaries:

Appomattox River up to Lake Chesdin Dam
Bailey Creek up to Route 630
Bailey Bay
Chickahominy River up to Walkers Dam
Skiffes Creek up to Skiffes Creek Dam
Pagan River and its tributary Jones Creek
Chuckatuck Creek
Nansemond River and its tributaries Bennett Creek and Star Creek
Hampton River
Willoughby Bay and the Elizabeth R. system (Western, Eastern, and Southern Branches and Lafayette R.) and tributaries St. Julian Creek, Deep Creek, and Broad Creek

The advisory was modified again on 10/10/2006 to add Poythress Run.

The impairments were combined. The TMDL for the lower extended portion is due in 2018.

Farrar Gut was mistakenly combined with the mainstem in previous assessments. The stream is a separate waterbody and is not included in the VDH Fish Consumption Advisory.

**IMPAIRMENT SOURCE:** Unknown

The source of the PCBs is considered unknown.

# Appendix A - List of Impaired (Category 5) Waters in 2010

## James River Basin

***Cause Group Code:*** **G10E-05-EBEN** **James River Mainstem - Chickahominy R. to Hog Point**

**Location:** This cause encompasses the James River Mainstem, from the confluence with Chickahominy River (coincident with the watershed G10 line, at approximately RM 48.40) downstream to line between Hog Point and mouth College Creek on the north shore of the James River. CBP segment JMSOH.

**City / County:** Isle Of Wight Co. James City Co. Newport News City Surry Co. Williamsburg City

**Use(s):** Aquatic Life

**Cause(s) / VA Category:** Estuarine Bioassessments / 5A

The Aquatic Life Use is impaired based on failure to meet a statistical evaluation constituting an un-impacted benthic organism population per CBP (Benthic-BIBI) analysis. The source/stressor tool yielded an unknown source for the impairment. Also listed impaired in 2004 IR based on CBP-BIBI probabilistic estuarine benthic assessment. This segment was previously included (2004 IR) in TMDL ID: VAT-G10E-05. The TMDL due date is carried from the previous 2004 IR impairment identification date.

| James River Mainstem - Chickahominy R. to Hog Point<br>**Aquatic Life** | Estuary (Sq. Miles) | Reservoir (Acres) | River (Miles) |
|---|---|---|---|
| Estuarine Bioassessments - Total Impaired Size by Water Type: | **26.128** | | |

Sources:

Source Unknown

# Appendix A - List of Impaired (Category 5) Waters in 2010

## James River Basin

***Cause Group Code:*** **G11E-05-EBEN** **James River - Hog Point Downstream to West side of Craney Island**

**Location:** This cause encompasses the James River Mainstem, from area of Hog Point (coincident with the CBP segment JMSMH line) downstream to West side of Craney Island (coincident with the end of CBP segment JMSMH. CBP segment JMSMH.

**City / County:** Isle Of Wight Co. James City Co. Newport News City Portsmouth City Suffolk City Surry Co.

**Use(s):** Aquatic Life

**Cause(s) / VA Category:** Estuarine Bioassessments / 5A

The Aquatic Life Use is impaired based on failure to meet a statistical evaluation constituting an un-impacted benthic organism population per CBP (Benthic-BIBI) analysis. The source/stressor tool yielded an unknown source for the impairment.
The TMDL due date is 2022.

| James River - Hog Point Downstream to West side of Craney Island | Estuary (Sq. Miles) | Reservoir (Acres) | River (Miles) |
|---|---|---|---|
| **Aquatic Life** | | | |
| Estuarine Bioassessments - Total Impaired Size by Water Type: | **98.316** | | |

Sources:

Source Unknown

## James River Basin

***Cause Group Code:*** **JMSMH-DO-BAY** **James River CBP segment JMSMH and Tidal Tributaries**

**Location:** This cause encompasses the entirety of the James River CBP segment JMSMH and tidal tributaries. From start of JMSMH salinity boundary (Hog Island Creek) downstream to line between Blunt Point NN) /Goodwin Pt. (Isle of Wight). CBP segment JMSMH.

**City / County:** Isle Of Wight Co. James City Co. Newport News City Portsmouth City Suffolk City Surry Co.

**Use(s):** Aquatic Life Open-Water Aquatic Life

**Cause(s) / VA Category:** Oxygen, Dissolved / 5A

The Aquatic Life and Open-Water Aquatic Life Use is impaired based on failure to meet the dissolved oxygen criteria for Open Water - Summer. The 30-day dissolved oxygen criteria for Open Water Use failed for the 2008 assessment. There is insufficient data to assess remaining shorter-term dissolved oxygen criteria for this use. The mainstem James River was included in EPA's 1998 303(d) Overlisting as impaired of the Aquatic Life Use; the impairment was attributed to excessive nutrients. During the 2006 cycle, the revised Chesapeake Bay water quality standards were adopted.

1998 CD segment for nutrients (Attachment A, Category 1, Part 2) VAT-G10E-04.

| James River CBP segment JMSMH and Tidal Tributaries | Estuary (Sq. Miles) | Reservoir (Acres) | River (Miles) |
|---|---|---|---|
| **Aquatic Life** | | | |
| Oxygen, Dissolved - Total Impaired Size by Water Type: | **118.514** | | |

| James River CBP segment JMSMH and Tidal Tributaries | Estuary (Sq. Miles) | Reservoir (Acres) | River (Miles) |
|---|---|---|---|
| **Open-Water Aquatic Life** | | | |
| Oxygen, Dissolved - Total Impaired Size by Water Type: | **118.514** | | |

Sources:

| | | | |
|---|---|---|---|
| Agriculture | Atmospheric Deposition - Nitrogen | Industrial Point Source Discharge | Internal Nutrient Recycling |
| Loss of Riparian Habitat | Municipal Point Source Discharges | Sources Outside State Jurisdiction or Borders | Wet Weather Discharges (Non-Point Source) |
| Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO) | | | |

# 2012 Fact Sheets for 303(d) Waters

**RIVER BASIN:** James River Basin

**HYDROLOGIC UNIT:** 02080206

**STREAM NAME:** **James River Oligohaline Estuary**

**TMDL ID:** **JMSOH-DO-BAY**

**2012 IMPAIRED AREA ID:** CB-JMSOH

**ASSESSMENT CATEGORY:** 4A

**TMDL DUE DATE:** 2010

**IMPAIRED SIZE:** 48.7295 - Sq. Mi.

**Watershed:** VAP-G03E

**INITIAL LISTING:** 1998

**UPSTREAM LIMIT:** Tidal Freshwater/Oligohaline Boundary

**DOWNSTREAM LIMIT:** Oligohaline/Mesohaline Boundary

The James River Oligohaline Estuary.

**CLEAN WATER ACT GOAL AND USE SUPPORT:**

Aquatic Life Use - Not Supporting, Open Water Subuse - Not Supporting

**IMPAIRMENT:** Dissolved Oxygen

The mainstem James River from the Appomattox River to the Chickahominy River was originally listed on the 1998 list as fully supporting but threatened of the Aquatic Life Use goal based on chlorophyll_ a exceedances. During the 1998 cycle, EPA extended the segment upstream to the fall line and downgraded the river to not supporting the Aquatic Life Use, citing nutrient concerns.

In previous cycles, the mainstem James River had acceptable dissolved oxygen levels.

During the 2006 cycle, the Chesapeake Bay water quality standards were implemented. The entire Oligohaline James River estuary failed the 30-day Open Water summer dissolved oxygen criteria.

However, during the 2010 cycle, the segment passed all DO criteria which could be assessed. The mainstem James River remained impaired for the Aquatic Life Uses since it is an EPA overlisted water. The tributaries were delisted (partial).

During the 2012 cycle, the segment remained fully supporting of all measured dissolved oxygen criteria and it will be delisted for dissolved oxygen. (It remains an impaired water due to chlorophyll a exceedances.) The Chesapeake Bay TMDL was approved by the EPA on 12/29/2010, however EPA policy indicates that it must remain listed until all dissolved oxygen criteria can be assessed,therefore it is Category 4A.

**IMPAIRMENT SOURCE:** Nonpoint Source, Point Source

All measured DO criteria are currently met.

**RECOMMENDATION:** Implementation

# 2012 Fact Sheets for 303(d) Waters

**RIVER BASIN:** James River Basin

**HYDROLOGIC UNIT:** 02080206

**STREAM NAME:** **James River**

**TMDL ID:** **G04E-04-CHLA**

**2012 IMPAIRED AREA ID:** CB-JMSOH

**ASSESSMENT CATEGORY:** 4A

**TMDL DUE DATE:** 2010

**IMPAIRED SIZE:** 46.539 - Sq. Mi.

**Watershed:** VAP-G04E

**INITIAL LISTING:** 2008

**UPSTREAM LIMIT:** Tidal Freshwater/Oligohaline boundary

**DOWNSTREAM LIMIT:** Oligohaline/Mesohaline boundary

The mainstem of the James River within the Oligohaline Estuary.

**CLEAN WATER ACT GOAL AND USE SUPPORT:**

Aquatic Life Use - Not Supporting, Open Water Subuse - Not Supporting

**IMPAIRMENT:** Chlorophyll

The James River from the Appomattox River to the Chickahominy River was originally listed on the 1998 list as fully supporting but threatened of the Aquatic Life Use goal based on chlorophyll_a exceedances. During the 1998 cycle, EPA extended the segment upstream to the fall line and downgraded the river to not supporting the Aquatic Life Use, citing nutrient concerns.

A special site-specific chlorophyll standard for the mainstem James River was adopted during the 2008 cycle. The oligohaline segment exceeds the spring seasonal mean.

The Chesapeake Bay TMDL was approved by the EPA on 12/29/2010, therefore it is Category 4A. However, the federal TMDL ID was not available at the time of the assessment.

**IMPAIRMENT SOURCE:** Point sources, Nonpoint Sources

Total nitrogen, total phosphorus, and total suspended solids were allocated to point and nonpoint sources throughout the Bay watershed.

**RECOMMENDATION:** Implementation

# 2012 Fact Sheets for 303(d) Waters

**RIVER BASIN:** James River Basin

**HYDROLOGIC UNIT:** 02080206

**STREAM NAME:** **James River and Various Tributaries**

**TMDL ID:** **G01E-03-PCB**

**2012 IMPAIRED AREA ID:** CB-JMSTFU

**ASSESSMENT CATEGORY:** 5A

**TMDL DUE DATE:** 2014

**IMPAIRED SIZE:** ~325 - Stream mile

**Watershed:** VAP-G01E

**INITIAL LISTING:** 2002

**UPSTREAM LIMIT:** Fall line

**DOWNSTREAM LIMIT:** Hampton Roads Bridge Tunnel

Estuarine James River from the fall line to the Hampton Roads Bridge Tunnel, including several tributaries listed below.

**CLEAN WATER ACT GOAL AND USE SUPPORT:**

Fish Consumption Use - Not Supporting

**IMPAIRMENT:** Fish Tissue - PCBs, VDH Fish Consumption Restriction

During the 2002 cycle, the James River from the Fall line to Queens Creek was considered not supporting of the Fish Consumption Use due to PCBs in multiple fish species at multiple DEQ monitoring locations.

During the 2004 cycle, a VDH Fish Consumption Restriction was issued from the fall line to Flowerdew Hundred and the segment was adjusted slightly to match the Restriction. In addition, in the 2004 cycle, the Chickahominy River from Walkers Dam to Diascund Creek was assessed as not supporting the Fish Consumption Use because the DEQ screening value for PCBs was exceeded in 3 species during sampling in 2001.

During the 2006 cycle, the VDH restriction was extended on 12/13/2004 to extend from the I-95 bridge downstream to the Hampton Roads Bridge Tunnel and include the tidal portions of the following tributaries:

Appomattox River up to Lake Chesdin Dam
Bailey Creek up to Route 630
Bailey Bay
Chickahominy River up to Walkers Dam
Skiffes Creek up to Skiffes Creek Dam
Pagan River and its tributary Jones Creek
Chuckatuck Creek
Nansemond River and its tributaries Bennett Creek and Star Creek
Hampton River
Willoughby Bay and the Elizabeth R. system (Western, Eastern, and Southern Branches and Lafayette R.) and tributaries St. Julian Creek, Deep Creek, and Broad Creek

The advisory was modified again on 10/10/2006 to add Poythress Run.

The impairments were combined. The TMDL for the lower extended portion is due in 2018.

**IMPAIRMENT SOURCE:** Unknown

The source of the PCBs is considered unknown.

**RECOMMENDATION:** Toxic Source Assessment

# Appendix 5 - List of Impaired (Category 5) Waters in 2012

## James River Basin

**_Cause Group Code:_ G10E-05-EBEN** **James River Mainstem - Chickahominy River to Hog Point**

Location: This cause encompasses the James River Mainstem, from the confluence with Chickahominy River (coincident with the watershed G10 line, at approximately RM 48.40) downstream to line between Hog Pt. and mouth College Creek on the north shore of the James River. CBP segment JMSOH.

City / County: Isle Of Wight Co James City Co Newport News City Surry Co Williamsburg City

Use(s): Aquatic Life

Cause(s) /
VA Category: Estuarine Bioassessments / 5A

The Aquatic Life Use is impaired based on failure to meet a statistical evaluation constituting an un-impacted benthic organism population per CBP (Benthic-BIBI) analysis. The source/stressor tool yielded an unknown source for the impairment. Also listed impaired in 2004 IR based on CBP-BIBI probabilistic estuarine benthic assessment. This segment was previously included (2004 IR) in TMDL ID: VAT-G10E-05. The TMDL due date is carried from the previous 2004 IR impairment identification date.

| James River Mainstem - Chickahominy River to Hog Point | Estuary (Sq. Miles) | Reservoir (Acres) | River (Miles) |
|---|---|---|---|
| **Aquatic Life** | | | |
| Estuarine Bioassessments - Total Impaired Size by Water Type: | **26.972** | | |

Sources:

Source Unknown

Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, Virginia 23060

AUG 1995
PRO

VIRGINIA POWER

August 9, 1995

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Camille S. Cook
Department of Environmental Quality
Piedmont Regional Water Office
P. O. Box 6030
Glen Allen, VA 23058

**Re: Surry Power Station, VA0004090**

Dear Ms. Cook:

Enclosed is a report titled "Mixing and Dilution of the Surry Nuclear Power Plant Cooling Water Discharge into the James River" by John Hamrick, Albert Kuo and Jian Shen of VIMS. This is the Effluent Mixing Study required by Special Condition 16 of the current VPDES permit.

Should you need additional information or have any questions about this matter, please contact Daniel James at 273-2996.

Sincerely,

B. M. Marshall, P.E.
Manager
Water Quality

Enclosure

cc w/enclosure:
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., NW
Suite 2900
Atlanta, GA 30323
Re: Surry Units 1 & 2
Docket Nos. 50-280/50-281
License Nos. DPR-32/DPR-37

cc: U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
Re: Surry Units 1 & 2
Docket Nos. 50-280/50-281
License Nos. DPR-32/DPR-37

Mr. M. W. Branch
NRC Senior Resident Inspector
Surry Power Station

# Mixing and Dilution of the Surry Nuclear Power Plant Cooling Water Discharge into the James River

by

John M. Hamrick
Albert Y. Kuo
and
Jian Shen

A Report To

Virginia Power Company
Richmond, VA

Department of Physical Sciences
Virginia Institute of Marine Science
School of Marine Science
The College of William and Mary
Gloucester Point, VA 23062.

July 1995

## ABSTRACT

This report describes and documents an analysis of the mixing and dilution of the Surry Nuclear Power Plant's cooling water discharge into the James River, Virginia. The analysis involves the application of the Virginia Institute of Marine Science's three-dimensional environmental fluid dynamics computer code, EFDC, to model the cooling water discharge and the mixing and dilution of a conservative tracer under field and hypothetical low and mean river flow conditions. The ability of the model to accurately represent mixing and dilution of the cooling water discharge is verified by the simulation of two dye release experiments conducted in January and October 1993. A comparison of observed and model simulated dye transport is presented. Based on preliminary simulations of low, mean and high river flows, the low flow regime, with salinity intrusion beyond Hog Island, was identified as the critical regime for cooling water flow dilution. To predict and analyze the mixing and dilution of conservative materials entering the river in the cooling water discharge, six model simulations were conducted using 1Q10, 7Q10, 30Q5 river discharges (20, 25, 41 cms respectively) and discharges of 100, 150, and 300 cms. The results of the three statistical low river discharges indicate that there is considerable recirculation of material through the cooling systems. For the three higher discharges, the recirculation effect is proportionally reduced. Relative concentration contour plots are presented for the six simulated flow rates along with procedures for their application in determining the relative concentrations and dilution factors corresponding to specific contaminant mass loading rates from the station's waste stream discharges into the cooling canal.

## ACKNOWLEDGMENT

The work described in this study was funded by the Virginia Power Company under contract to the Virginia Institute of Marine Science, College of William and Mary. The cooperation and assistance of Messrs. G. Bishop, B. Belsches, and R. Raper of Virginia Power is acknowledged.

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## 1. INTRODUCTION

This report presents the results of a field and numerical model study of the mixing and dilution of material discharged with the cooling water from the Virginia Power Company's Surry Nuclear Power Station into the James River. The study consists of three parts: (1) prototype field dye release experiments, (2) verification of the numerical model by its ability to simulate the field dye releases, and (3) application of the numerical model to simulate the distribution of conservative materials discharged in the cooling water into the James River. The dye release experiments served to quantify the mixing and dilution capability of the river, and to provide data for verification of the numerical model (VIMS Environmental Fluid Dynamics Code, EFDC). After being verified, the model is used to predict the distribution and dilution of discharged material in the river under various assumed hydrographic conditions.

The Surry Nuclear Power Station is located at the transition region between fresh tidal river and estuarine proper of the James River, Virginia. Under river discharge condition characteristic of most of the year the upper limit of salt intrusion in the James River is upriver of the power station, located at Hog Island, with power plant cooling water withdrawn from and discharged into saline ambient water characteristic of the estuarine proper. During periods of very high river flow the saline water is pushed down river of the power station, with the ambient conditions then being characteristic of a freshwater tidal river. Since the characteristics of net circulation under estuarine proper and fresh water tidal river conditions are very different, two dye release experiments were conducted during periods representative of the two regimes. The numerical model verifications were also made for both of the flow regimes.

## 2. FIELD DYE RELEASE EXPERIMENTS

Two field dye release experiments were conducted: one at high river flow and the other at low river flow. The dye used for the experiments was Rhodamine WT, which is manufactured by E. I. DuPont de Nemours & Company. The dye is sold in 20 % solution with a density of 1.2 g/cubic cm. The stock dye was diluted by one half with water drawn from the cooling water discharge canal in order to adjust the density to be more nearly that of the receiving water. In each of the experiments, a total of 60 gallons of diluted dye solution was discharged at a constant rate over a period of approximately one tidal cycle. The dye solution was injected at the water surface near the head of the cooling water discharge canal. The negative buoyancy of the dye solution, and the turbulence and large eddies in the discharge canal assured fast spreading and mixing of the dye with the cooling water.

At the end of each dye release and for several days thereafter, the dye distributions in the river were measured with a fluorometer aboard a moving vessel. The fluorometry equipment aboard the vessel consisted of a portable generator supplying AC power, a Turner Design Model 10 Fluorometer, and a small pump powered by a 12 volt battery. The pump drew river water from a depth of approximately 0.5 ft. below the water surface and circulated the water through the fluorometer. A portable computer was used for recording the dye concentration as well as controlling the frequency of data recording. The dye concentration was recorded every 6 seconds while the vessel was moving through the area where measurable concentration existed. Calibration of the fluorometer was accomplished by placing its field sample intake and exhaust into a known volume of freshwater, then incrementally adding known volumes of a known dye concentration so that a curve of final dye concentration versus 'fluorescence units' was obtained. At the beginning and end of each sampling run, the calibration was checked by a sample of known dye concentration so that any shift in calibration might be taken into account during reduction of raw data.

To determine the location of each dye measurement, the vessel was also equipped with a Del Norte transponder positioning system. The master transponder was stationed on the vessel with the DDMU (digital distance measuring unit). Five remote transponders were strategically located on either bank of the river so that at least 3 of the transponders could receive the signal from the vessel at any point in the area of interest. Figure 1 shows the locations of the remote transponders. The distances from the vessel to remote transponders were also recorded in the computer for calculation of vessel location.

## 2.1. High Flow Experiment

The high flow experiment was conducted from January 30 to February 4, 1993. The diluted dye solution was continuously released to the cooling water discharge canal at a constant rate from 1725 hours, January 30 to 0655 hours, January 31 (both around slack water before ebb). The dye concentration distributions in the river were measured twice, once in the morning and then in the afternoon, on January 31, the first day after the dye release. Only one measurement was made on the second day in the afternoon, since the field crew spent the morning replacing some of the batteries for the remote transponders, which became dead because of low temperatures. The night time temperature dropped to 25 deg. F prior to battery failures. No measurements were made on February 2 and 3 because of strong wind, high waves and low temperature. Wind speed on the average of 14 miles per hour and day time high temperatures of 30 deg. F were recorded on those days. The last dye concentration measurements were conducted on February 4 between 0930 and 1230 hours.

Table 1 summarizes the conditions pertinent to the high flow experiment. The field data for dye concentrations are presented in Figures 3(a) through 3(f) for comparison with numerical model simulation results. Since the model results are instantaneous distributions at selected times, only those field data measured in the two hour interval centered around the model output time are presented. In addition to the measurement of the horizontal dye distribution near the water surface, several vertical distributions were made by stopping the vessel and lowering the intake of sampling pump to the mid-depth and near bottom. It was found that there was little difference in dye concentration at different depths during both measurements on January 31 (Table 1), the first day after dye release. The strong wind and high waves essentially completely mixed the water column vertically.

## 2.2. Low Flow Experiment

The low flow experiment was conducted from October 22 to October 25, 1993. Salinity in the cooling water was monitored one week prior to the experiment to ensure that this reach of the river was within the estuarine proper. The cooling water salinity was 13 and 12 parts per thousand on October 14 and 21 respectively. The diluted dye solution was continuously released to the cooling water discharge canal at a constant rate from 2032 hours, October 22 to 0800 hours, October 23 (both around slack water before ebb). A total of five surveys were conducted to measure the dye concentration distributions in the river. Two surveys, one in the morning and the other in the afternoon, were made on each of the next two days following the dye release. The last survey was conducted on the morning of October 25.

**Table 1. High River Flow Dye Release Experiment**
**January/February, 1993**

| | | | |
|---|---|---|---|
| Study Period | January 30 to February 4 | | |
| Period of Dye Release | 1725 hours, 1/30 to 0655 hours, 1/31 | | |
| Total Amount of Dye Released | 50 pounds in 10% solution | | |
| Cooling Water | | | |
| Discharge Rate | 2016 mgd, steady | | |
| Salinity | 0 through 2/2, 3 psu on 2/3 and 2/4 | | |
| Intake Temperature | 5 C-7 C | | |
| Discharge Temp. | 13 C-16 C | | |
| Dye Concentration in Discharge Canal during Period of Dye Release | 5.29 parts per billion | | |
| Vertical Distribution of Dye at Selected Locations | surface | mid-depth | bottom (depth) |
| January 31, a.m. | 1.6 | 1.6 | 1.6 |
| | 2.6 | 2.6 | 2.4 |
| January 31, p.m. (about 200 ft. from jetty) | 3.2 | 3.2 | 3.4 (11 ft.) |

## Table 2. Low River Flow Dye Release Experiment
October, 1993

| | | | |
|---|---|---|---|
| Study Period | October 22 to October 25 | | |
| Period of Dye Release | 2032 hours, 10/22 to 0800 hours, 10/23 | | |
| Total Amount of Dye Released | 50 pounds in 10% solution | | |
| Cooling Water | | | |
| Discharge Rate | 2016 mgd, steady | | |
| Salinity | 12 psu, steady | | |
| Intake Temperature | 17.1 C-18.5 C | | |
| Discharge Temp. | 23 C-26 C | | |
| Dye Concentration in Discharge Canal During Period of Dye Release | 6.21 parts per billion | | |
| Vertical Distribution of Dye at Selected Locations | surface | mid-depth | bottom (depth) |
| October 23 | 0.52 | 0.42 | 0.50 (8 ft.) |
| | 1.8 | 1.75 | 2.00 (12 ft.) |
| October 24 | 0.24 | 0.15 | 0.14 (25 ft.) |
| October 25 | 0.08 | 0.07 | 0.08 |

Table 2 summarizes the conditions pertinent to the low flow experiment. The field data of dye concentrations are presented in Figures 4(a) through 4(f) for comparison with model simulation results. Since the model results are instantaneous distributions at selected times, only those field data measured in the two hour interval centered around the model output time are presented. In addition to the measurements of the horizontal dye distribution near the water surface, several vertical distributions of dye were measured on October 23 and 24. The results are included in Table 2. It shows that the vertical mixing was not as complete as that during the high flow experiment.

## 3. MODEL SIMULATION OF THE DYE RELEASE EXPERIMENTS

The VIMS three-dimensional estuary and coastal ocean circulation and transport model, EFDC (Environmental Fluid Dynamics Code) (Hamrick, 1991, 1992) was used in this study to simulate the mixing and dilution of the cooling water discharge. The model has been applied to the James River and calibrated with respect to surface elevation, velocity and salinity using field data sets existing at VIMS (Hamrick, *et al.* 1995). A summary of the model's capabilities and its previous applications is found in Appendix A. The James River configuration of the EFDC model uses a 370 m square grid in the horizontal and six stretched layers in the vertical. The model domain extends from the entrance to Hampton Roads to Richmond. Figure 2 shows the model grid of the James River. The model's ability to simulate mixing and dilution of the cooling water was verified by simulating the two previously described field dye experiments. The model was then used to predict the mixing and dilution of conservative or non decaying material in the cooling water under various hydrologic conditions.

### 3.1 Simulation of the High Flow Dye Release

For the January-February 1993 high flow dye release, the model was forced with predicted astronomical tides at the entrance to Hampton Roads, observed winds recorded at the Norfolk, Virginia Airport, and gauged flows in the James, Appomatox and Chickahominy Rivers provided by the U. S. Geological Survey. The gauged river flows were slightly adjusted to account for ungauged drainage areas. Thermal effects due to the increase in temperature (approximately 8 deg C) of the cooling flow between the cooling canal intake and outlet were accounted for using an equilibrium surface heat exchange formulation with an estimated January equilibrium temperature of 1.2 deg. C and an exchange coefficient of 5.7E-6 square meters per second (Cerco and Cole, 1993). The model was initialized for the dye release simulation by a preliminary 33 day simulation beginning on December 28, 1992. Following the preliminary simulation, the model was restarted and executed for an approximately six day simulation of the dye release. One hour averaged surface and bottom layer dye concentration distributions were output and saved during the simulation. The average total river discharge during the six day simulation was approximately 218 cms (7700 cfs).

Figures 3(a) through 3(f) show comparisons of model predictions of dye concentration distributions and field samples near the water surface. Model predictions are shown as dotted contour lines with large font numbers indicating contour values. The field observations are point values in small fonts. The model predictions are two hour averages corresponding to the time intervals of the field sampling. Figures 3(a&b) show conditions at approximately 15.5 and 17.6 hours after the beginning of the dye release (approximately 3 and 5 hours after the release ended). The actual dye distributions tend to attach to the shoreline and not mix as rapidly as the model predicts, although the model predicted 1, 1.5, and 2 ppb (parts per billion) contours do tend to qualitatively agree with the field observations. Figures 3(c&d) show conditions 20.7 and 22.8 hours after the beginning of the dye release. Model predictions of the 0.5 and 1.0 ppb contours at the point agree well with observations. In the vicinity of the cooling water discharge, the agreement is poor. The high field observed concentrations can likely be attributed to the transport of high dye concentration water, initially trapped against the shoreline, into the edge of the cooling water discharge plume and northwestward across the river. Figures 3(e&f) show conditions at approximately 47 hours after the beginning of the dye release. Model predicted contours of 0.1, 0.2, and 0.3 ppb eastward of the point generally agree with about one half of the observations, with the remaining observations having higher concentrations. Inspection of the field observations in all six figures (a-f) indicates considerable variability and patchiness, typical of dye distributions under significant wind variability. Since the model was forced with three hour average wind conditions at Norfolk, the degree of agreement between the model predictions and field observations is reasonable.

### 3.2 Simulation of the Low Flow Dye Release

For the October 1993 low flow dye release, the model was forced with predicted astronomical tides at the entrance to Hampton Roads, observed winds recorded at the Norfolk, Virginia Airport, and gauged flows in the James, Appomatox and Chickahominy Rivers provided by the U. S. Geological Survey. The gauged river flows were slightly adjusted to account for ungauged drainage areas. Thermal effects due to the increase in temperature (approximately 7 deg C) of the cooling flow between the cooling canal intake and outlet were accounted for using an equilibrium surface heat exchange formulation with an estimated October equilibrium temperature of 15 deg. C and an exchange coefficient of 7.6E-6 square meters per second (Cerco and Cole, 1993). The model was initialized for the dye release simulation by a preliminary 21 day simulation beginning on September 29, 1993. Following the preliminary simulation, the model was restarted and executed for an approximately six day simulation of the dye release. One hour averaged surface and bottom layer dye concentration distributions were output and saved during the simulation. The average total river discharge during the six day simulation was approximately 49 cms (1730 cfs).

Figures 4(a) through 4(f) show comparisons of model predictions of dye concentration distributions and field samples near the water surface. Model predictions are shown as dotted contour lines with large fonts indicating the contour intervals, while point field observations are shown in small font. Figures 4(a&b) show conditions approximately 13 hours after the beginning of the dye release (approximately at the end of the release). Agreement in the vicinity of the 0.1 and 0.3 contours in Figure 4(a) is generally good. In Figure 4(b), the observed concentration southwest of the discharge canal are underpredicted with agreement being better along the shoreline north of the discharge canal. Figures 4(c&d) show conditions approximately 18 hours after the beginning of the dye release. Approximately one half of the field observations agree well with nearby model predicted contours. Figure 4(e) shows conditions approximately 36 hours after the beginning of the dye release. Agreement is reasonably good in the 0.1 to 0.3 contour interval. Figure 4(f) shows conditions approximately 45 hours after the beginning of the dye release. Agreement is particularly good along the 0.1, 0.15, and 0.2 contours both west and east of the point. The good agreement of far field dye observations and model predictions after a number of days tend to give credence to the numerical model's ability to predict the mixing and dilution of continuous contaminant discharges from the cooling water canal.

## 4. MIXING AND DILUTION SIMULATIONS AND ANALYSES

Following the preceding described verification, the EFDC model was used to simulate the mixing and dilution of a conservative material discharged in the cooling water into the river. These simulations were conducted using three accepted definitions of low flow, a 1Q10 (one day low flow with a 10 year recurrence) of 20 cms, a 7Q10 (seven day low flow with a 10 year recurrence) of 25 cms and a 30Q5 (30 day low flow with a five year recurrence) of 41 cms. For comparison, three additional simulations using river flows of 100, 150, and 300 cms were conducted. The 150 cms flow corresponds to the long term mean flow for the months of September and October. Tables 3 and 4 lists the simulation flow rates and maximum relative concentrations on the north shoreline of the river. For the six dilution simulations, the model was forced with a mean tide amplitude at the M2 period of 12.42 hours at the entrance to Hampton Roads. No wind forcing was applied. The temperature rise through the cooling canal was 8 deg C and the cooling water flow of 88.3 cms. The equilibrium temperature was assumed to be 15 deg. C with a surface exchange coefficient of 7.6E-6 square meters per second, corresponding to conditions typical of late summer or early fall.

## 4.1 Mixing and Dilution Analysis Procedure

The mixing and dilution analysis to be presented is based on the following formulation. For a waste stream discharge of concentration $C_w$ at a volumetric flow rate $Q_w$, into the cooling canal having an intake flow rate of $Q_i$ and intake concentration of $C_i$, the concentration of material in the cooling water discharge, $C_d$ is given by:

$$C_d = \frac{(Q_i C_i + Q_w C_w)}{Q_d} \qquad Q_d = (Q_w + Q_i) \tag{1}$$

Since the waste stream volume flow is likely orders of magnitude smaller than the flow rate through the cooling canal, (1) is well approximated by:

$$C_d = \frac{(Q_d C_i + Q_w C_w)}{Q_d} = \frac{(Q_d C_i + M_w)}{Q_d} \tag{2}$$

where $Q_d$ now represents the cooling canal discharge and the product, $Q_wC_w$, can alternately be written in terms of the contaminant mass loading, $M_w$ (with units such as gm/sec or kg/day). The concentration rise between the cooling canal intake and discharge is:

$$C_d - C_i = \Delta C = \frac{M_w}{Q_d} = \frac{Q_w C_w}{Q_d} \tag{3}$$

A number of measures of mixing and dilution may be defined. Since the cooling canal is not a regulated public water body, a strict interpretation of regulations leads to the definition of relative concentration, $R$ based on the ratio of the contaminant concentration at any time and location in the river to the concentration in the cooling canal discharge, defined by

$$R_d = \frac{C}{C_d} = \frac{C}{(C_i + \Delta C)} = \frac{C}{\left(C_i + \frac{M_w}{Q_d}\right)} = \frac{C}{\left(C_i + \frac{Q_w C_w}{Q_d}\right)} \tag{4}$$

where the $R_d$ denotes the relative concentration defined with respect to the cooling water discharge canal concentration. Often the inverse of the above defined relative concentration, which we prefer to call a mixing factor, but is also referred to as a dilution factor, is used. For example, if at some location in the river, the concentration is 1 % of the concentration in the discharge canal, the relative concentration would be 0.01 indicating a 100 to 1 dilution and a mixing or dilution factor of 100.

If the cooling canal is considered to be a regulated water body, the relative concentration, $R_w$ with respect to the waste stream concentration is given by:

$$R_w = \frac{C}{C_w} \tag{5}$$

and is related to the relative concentration with respect to the discharge canal concentration by:

$$R_w = \frac{C}{C_d}\frac{C_d}{C_w} = R_d\left(1 + \frac{Q_d C_i}{Q_w C_w}\right)\frac{Q_w}{Q_d} \tag{6}$$

Equation (4) allows the concentration at the cooling canal intake to be expressed as:

$$C_i = \frac{R_d(Intake)}{(1 - R_d(Intake))}\frac{M_w}{Q_d} = \frac{R_d(Intake)}{(1 - R_d(Intake))}\frac{Q_w C_w}{Q_d} \tag{7}$$

which combines with (6) to gives:

$$R_w = \left(\frac{1}{1 - R_d(Intake)}\right) R_d \frac{Q_w}{Q_d} \tag{8}$$

Equation (8) provides an expression for the relative concentration with respect to the waste stream contaminant concentration, $R_w$, at any time and location. The relative concentration, $R_w$, is expressed in terms of the relative concentration with respect to the discharge canal concentration, at the same time and location, the relative concentration at the discharge canal intake with respect to the discharge canal concentration, and the ratio of the waste stream flow rate to the cooling water canal flow rate. The flow rate ratio in (8) essentially determines the relative dilution of the waste stream discharge into the cooling water canal and will be very small considering the high flow rate through the cooling canal. The term in parenthesis, which we call the recirculation factor, accounts for the effect of recirculation of discharged cooling water around Hog Island and back into the cooling canal intake. The recirculation factor has a minimum value of one when $R_d(intake)$ equals zero, i.e. no cooling water is recirculated through the intake. In this case, equation (8) is reduced to: $C_d = C_w Q_w / Q_d$. Equation (8) is useful in providing an alternate measure of mixing and can be used to determine actual contaminant concentrations in the river, given the concentration in the waste stream.

## 4.2 Analysis of Mixing and Dilution Simulations

A generic set of model mixing and dilution simulation runs at various flow rates were conducted to determine the distribution of relative concentration with respect to the cooling canal discharge concentration and the recirculation factor for use in determining the relative concentration with respect to the waste stream concentration. The generic simulations were performed by specifying a concentration rise between the canal intake and discharge, $\Delta C$ of 100. For all six river discharge simulations, the model was time integrated until a quasi-steady state (i.e., not changing at any tidal cycle phase from one tidal cycle to the next) concentration distribution was reached. The relative concentration with respect to the cooling canal discharge concentration was then determined by:

$$R_d = \frac{C}{C_d} = \frac{C}{(C_i + \Delta C)} = \frac{C}{(C_i + 100)} \tag{9}$$

Contour plots at the times of maximum instantaneous across shore or north shore relative concentration and tidal cycle averaged relative concentration with respect to the cooling canal discharge concentration for different flow rates are shown in Figures 5 through 16 and summarized in Tables 3 and 4.

Table 3 summarizes the maximum instantaneous across shore surface and bottom relative concentrations with respect to the cooling canal discharge concentration. These values correspond to the highest relative concentrations, or highest absolute concentration on the far shoreline predicted during a tidal cycle. As the river flow rate increases, the far shore location of the maximum relative concentrations moves downstream from Jamestown Island at low flows toward Mulberry Point at the highest river flow rate. The immediate conclusion which can be drawn from Table 3 is that there is relatively little dilution, indicated by the large relative concentration values, of the cooling water discharge at the three statistical low flow rates and only marginal increases in dilution at the three higher flow rates. The relative concentration of 0.54, for the 150 cms discharge, corresponding to average conditions over the months of September and October indicates that on the far shore, the cooling discharge has only been diluted by a factor of approximately 1.85. The relative concentration of 0.51 for the 300 cms flow indicated only a dilution of approximately 2 to 1, for a flow rate which exceeds the annual mean flow. Table 4 summaries similar results based on tidal cycle average conditions at the same across shore locations.

Tables 5 and 6 summarize the instantaneous and tidal cycle averaged recirculation and conversion factors in Equation (8), which can be used to predict maximum relative concentrations on the far shoreline with respect to the waste stream concentration. The recirculation factor remains on the order of 2.25 for the five lower flow rates and falls to apprximately 1.9 at the 300 cms flow, indicating a relative insensitivity to river flow rates of less than 150 cms. To illustrate the application of Equation (8) and the results tabulated in Tables 5 and 6, consider the 1Q10 and 300cms flow conditions in Table 6. For a waste stream discharge corresponding to 1 per cent of the cooling flow, at the 1Q10 flow, the maximum relative concentration with respect to the waste stream concentration would be 0.0159 (dilution or mixing factor of 63 to 1) , while at the 300 cms flow the value would be 0.0091 (dilution or mixing factor or 110 to 1). This indicates that the 300 cms river flow results in approximately 80 percent increase in dilution relative to the waste stream concentration.

Table 3. Maximum Instaneous Relative Concentrations with Respect to Concentration in the Cooling Canal Discharge.

| Flow Condition (flow rates in cms) | Across Shore Relative Surface Concentration | Across Shore Relative Bottom Concentration |
|---|---|---|
| 1Q10<br>20 cms | 0.71 | 0.71 |
| 7Q10<br>25 cms | 0.69 | 0.69 |
| 30Q5<br>41 cms | 0.67 | 0.67 |
| 100 cms | 0.57 | 0.57 |
| 150 cms | 0.54 | 0.54 |
| 300 cms | 0.51 | 0.51 |

Note: Minimum dilutions relative to the discharge canal concentration are defined as the inverse of the maximum relative concentrations.

Table 4. Maximum Tidal Cycle Averaged Relative Concentrations with Respect to Concentration in the Cooling Canal Discharge.

| Flow Condition (flow rates in cms) | Across Shore Relative Surface Concentration | Across Shore Relative Bottom Concentration |
|---|---|---|
| 1Q10<br>20 cms | 0.70 | 0.70 |
| 7Q10<br>25 cms | 0.69 | 0.69 |
| 30Q5<br>41 cms | 0.66 | 0.66 |
| 100 cms | 0.57 | 0.57 |
| 150 cms | 0.54 | 0.54 |
| 300 cms | 0.48 | 0.48 |

Note: Minimum dilutions relative to the discharge canal concentration are defined as the inverse of the maximum relative concentrations

**Table 5. Instantaneous Recirculation Factors and Conversion Factors for Relative Concentrations with Respect to Concentration in the Waste Stream Discharge.**

| Flow Condition (flow rates in cms) | Recirculation Factor $1/(1\text{-}R_d(intake))$ | Maximum Concentration Conversion Factor $R_d/(1\text{-}R_d(intake))$ |
|---|---|---|
| 1Q10 20 cms | 2.22 | 1.58 |
| 7Q10 25 cms | 2.21 | 1.53 |
| 30Q5 41 cms | 2.30 | 1.55 |
| 100 cms | 2.30 | 1.31 |
| 150 cms | 2.24 | 1.21 |
| 300 cms | 1.89 | 0.97 |

Note: To determine the maximum relative concentration with respect to the waste stream concentration, the conversion factors in column three of the above table should be multiplied by $Q_w/Q_d$, the ratio of the waste stream discharge to the cooling canal discharge.

**Table 6. Tidal Cycle Averaged Recirculation Factors and Conversion Factors for Relative Concentrations with Respect to Concentration in the Waste Stream Discharge.**

| Flow Condition (flow rates in cms) | Recirculation Factor<br>*1/(1-Rd(intake))* | Maximum Concentration Conversion Factor<br>*Rd/(1-Rd(intake))* |
|---|---|---|
| 1Q10<br>20 cms | 2.26 | 1.59 |
| 7Q10<br>25 cms | 2.24 | 1.53 |
| 30Q5<br>41 cms | 2.33 | 1.54 |
| 100 cms | 2.31 | 1.32 |
| 150 cms | 2.24 | 1.21 |
| 300 cms | 1.89 | 0.91 |

Note: To determine the maximum relative concentration with respect to the waste stream concentration, the conversion factors in column three of the above table should be multiplied by $Q_w/Q_d$, the ratio of the waste stream discharge to the cooling canal discharge.

## 5. SUMMARY AND CONCLUSIONS

This report presents the results of a field and numerical modeling study of the mixing and dilution of a generic contaminant in the Surry Nuclear Power Station's cooling water discharge. The two major findings of this study are: the large magnitude of the tidal flow relative to the river discharge and the recirculation of cooling water from the cooling canal discharge to the intake results in little sensitivity of discharge dilution to variations in river flow; and the regulatory definition of dilution plays the primary role in defining mixing efficiency. If the contaminant dilution is defined with respect to its concentration in the cooling water canal discharge, low dilutions ranging from 1.43 to 1 at the 1q10 river flow (21 cms) to 2.08 to 1 at a 300 cms river flow result. The marginal increase in dilution with an approximately 15 times higher river discharge clearly indicates the insensitivity to river discharge. If dilution is defined with respect to the concentration in the Power Station's waste stream, which is discharged into the cooling canal, the primary determinant of dilution and mixing is the ratio of the waste stream flow to the cooling canal flow. For a waste stream flow rate corresponding to one per cent of the cooling canal flow, the dilutions at the 1Q10 and 300 cms river flows are 63 to 1 and approximately 100 to 1 respectively. With regard to instream standards, the results summarized in this report may be used to determine absolute concentration distributions in the James River, for specified contaminant mass loading in the power station's waste stream.

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Hamrick, J.M. 1991. A three-dimensional environmental fluid dynamics computer code: theoretical and computational aspects. SRAMSOE No. 317, Virginia Institute of Marine Science, Gloucester Point, VA. 63pp.

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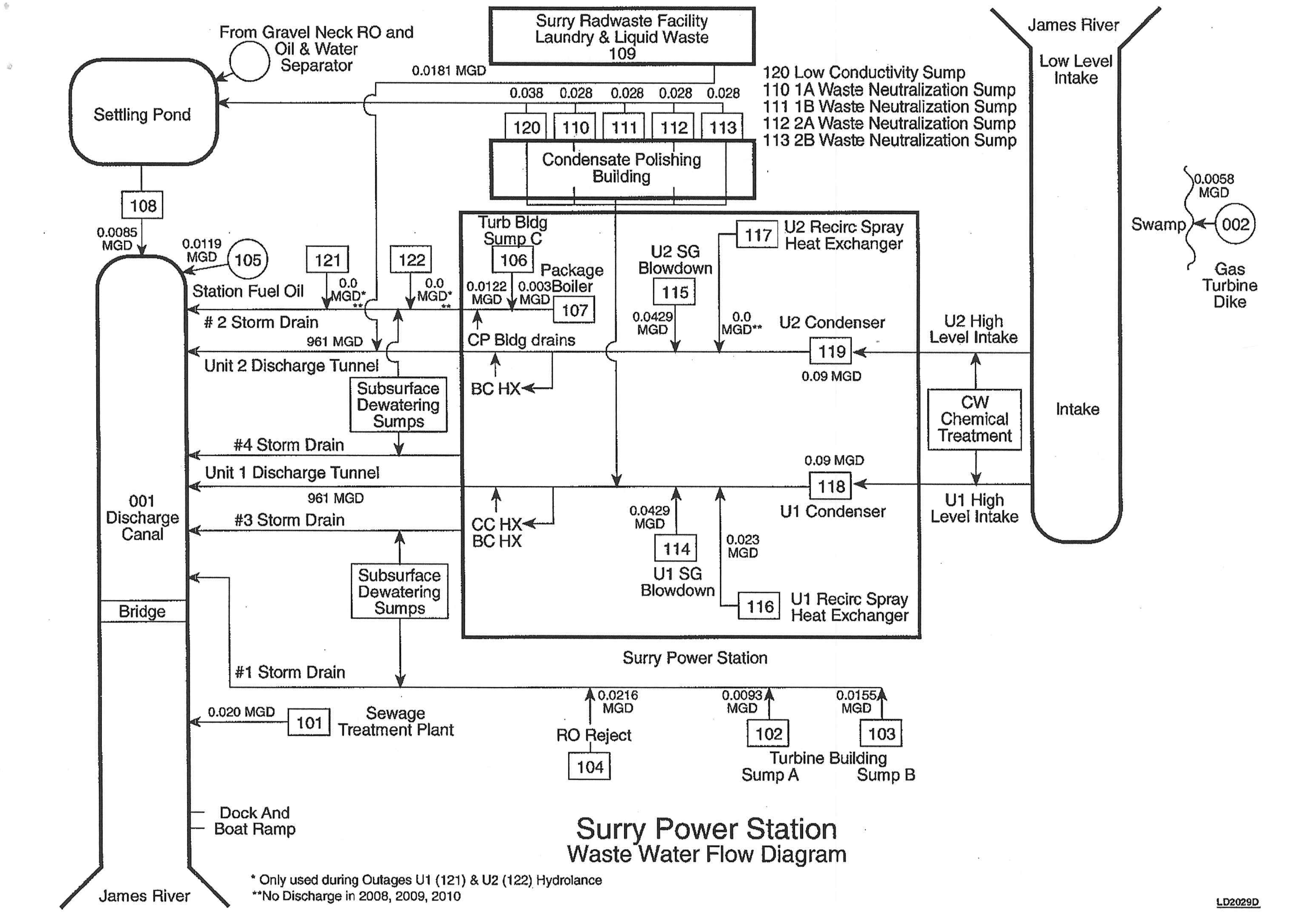
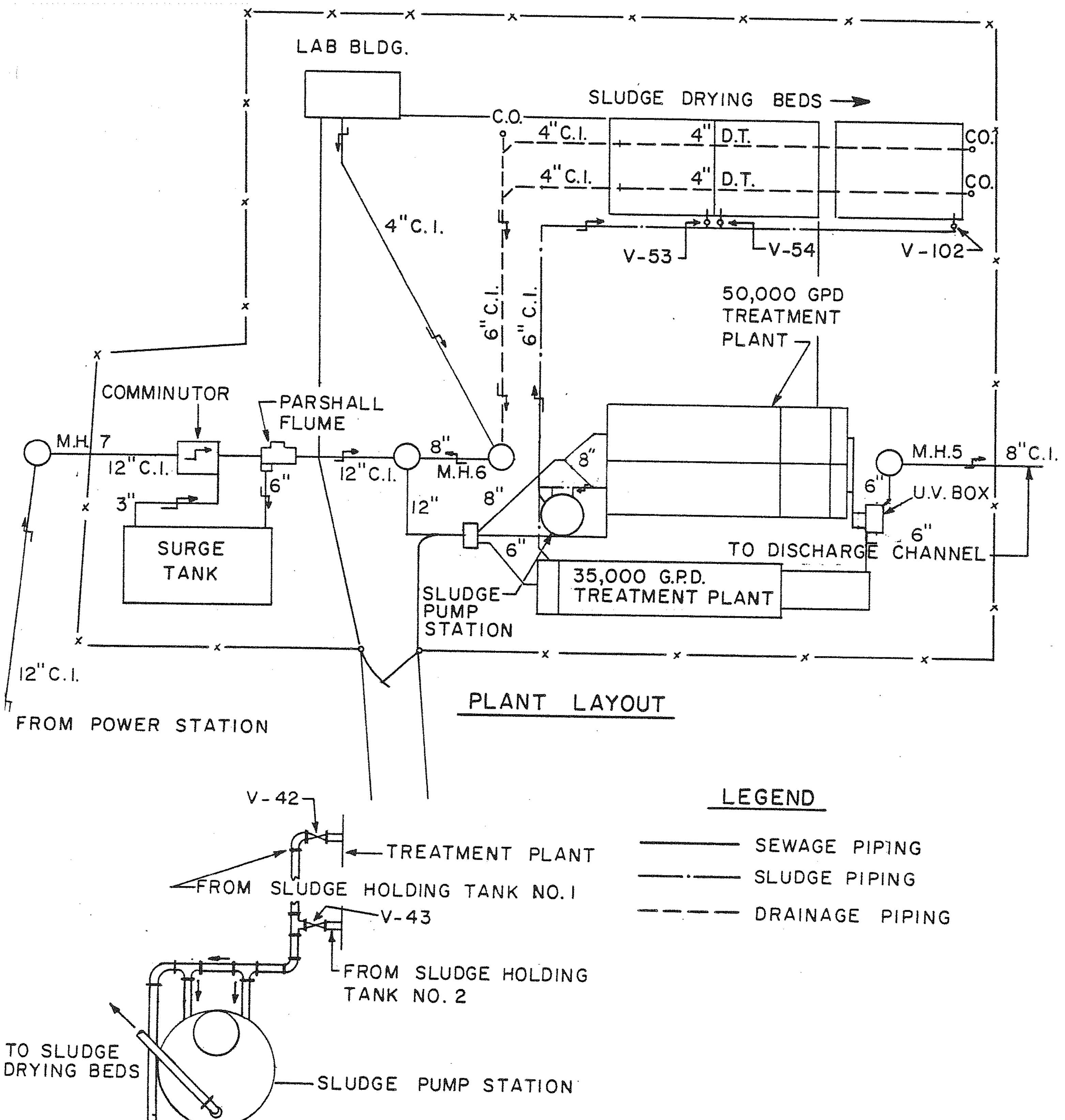
Hamrick, J.M., *et. al.*, 1995. A three-dimensional environmental fluid dynamics computer code: application to the James River, Virginia. SRAMSOE No. xxx, Virginia Institute of Marine Science, Gloucester Point, VA. (in preparation).

## Attachment B

Flow Diagram, Outfall Location Map, Sewage Treatment Plant Diagram, Storm Water Outfall Location Map, Well Location Map

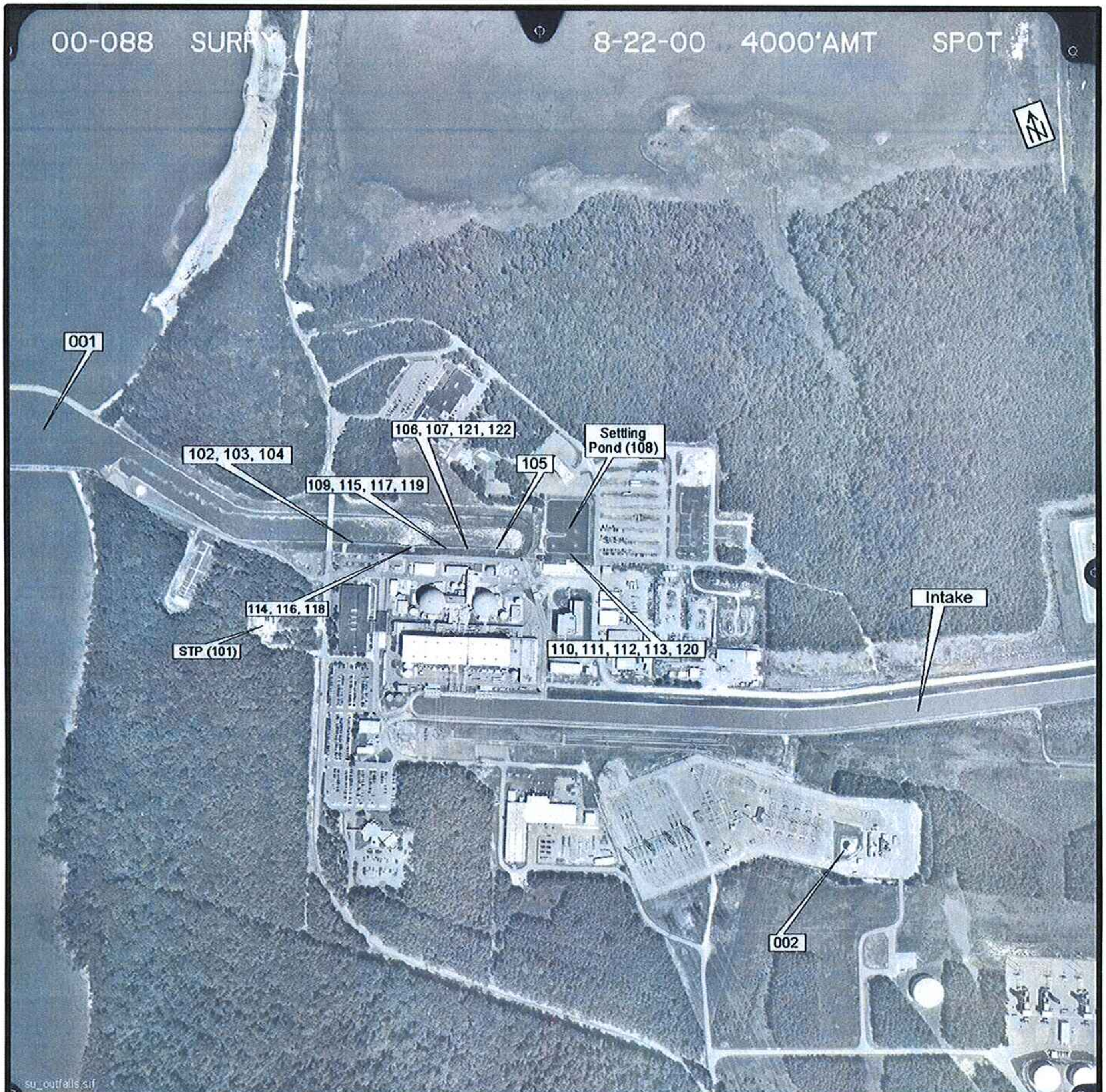

Surry Radwaste Facility
Laundry & Liquid Waste
109
From Gravel Neck RO and
Oil & Water
Separator
Settling Pond
0.0181 MGD
0.038
0.028
0.028
0.028
0.028
120
110
111
112
113
120 Low Conductivity Sump
110 1A Waste Neutralization Sump
111 1B Waste Neutralization Sump
112 2A Waste Neutralization Sump
113 2B Waste Neutralization Sump
Condensate Polishing
Building
James River
Low Level
Intake
108
0.0085
MGD
0.0119
MGD
105
Station Fuel Oil
121
0.0
MGD*
**
122
0.0
MGD*
**
Turb Bldg
Sump C
106
Package
Boiler
0.0122
MGD
0.003
MGD
107
U2 SG
Blowdown
115
117
U2 Recirc Spray
Heat Exchanger
0.0058
MGD
Swamp
002
Gas
Turbine
Dike
# 2 Storm Drain
961 MGD
CP Bldg drains
0.0429
MGD
0.0
MGD**
U2 Condenser
U2 High
Level Intake
119
0.09 MGD
Unit 2 Discharge Tunnel
Subsurface
Dewatering
Sumps
BC HX
CW
Chemical
Treatment
Intake
#4 Storm Drain
0.09 MGD
Unit 1 Discharge Tunnel
961 MGD
118
U1 Condenser
U1 High
Level Intake
001
Discharge
Canal
#3 Storm Drain
CC HX
BC HX
0.0429
MGD
114
U1 SG
Blowdown
0.023
MGD
Subsurface
Dewatering
Sumps
116
U1 Recirc Spray
Heat Exchanger
Bridge
Surry Power Station
#1 Storm Drain
0.0216
MGD
0.0093
MGD
0.0155
MGD
0.020 MGD
101
Sewage
Treatment Plant
RO Reject
104
102
103
Turbine Building
Sump A
Sump B
Dock And
Boat Ramp
James River
Surry Power Station
Waste Water Flow Diagram
* Only used during Outages U1 (121) & U2 (122) Hydrolance
**No Discharge in 2008, 2009, 2010
LD2029D




NOTE: Disinfection is accomplished by chlorination, not UV.

FIGURE 2-2

PLANT LAYOUT & SEWAGE & SLUDGE PIPING

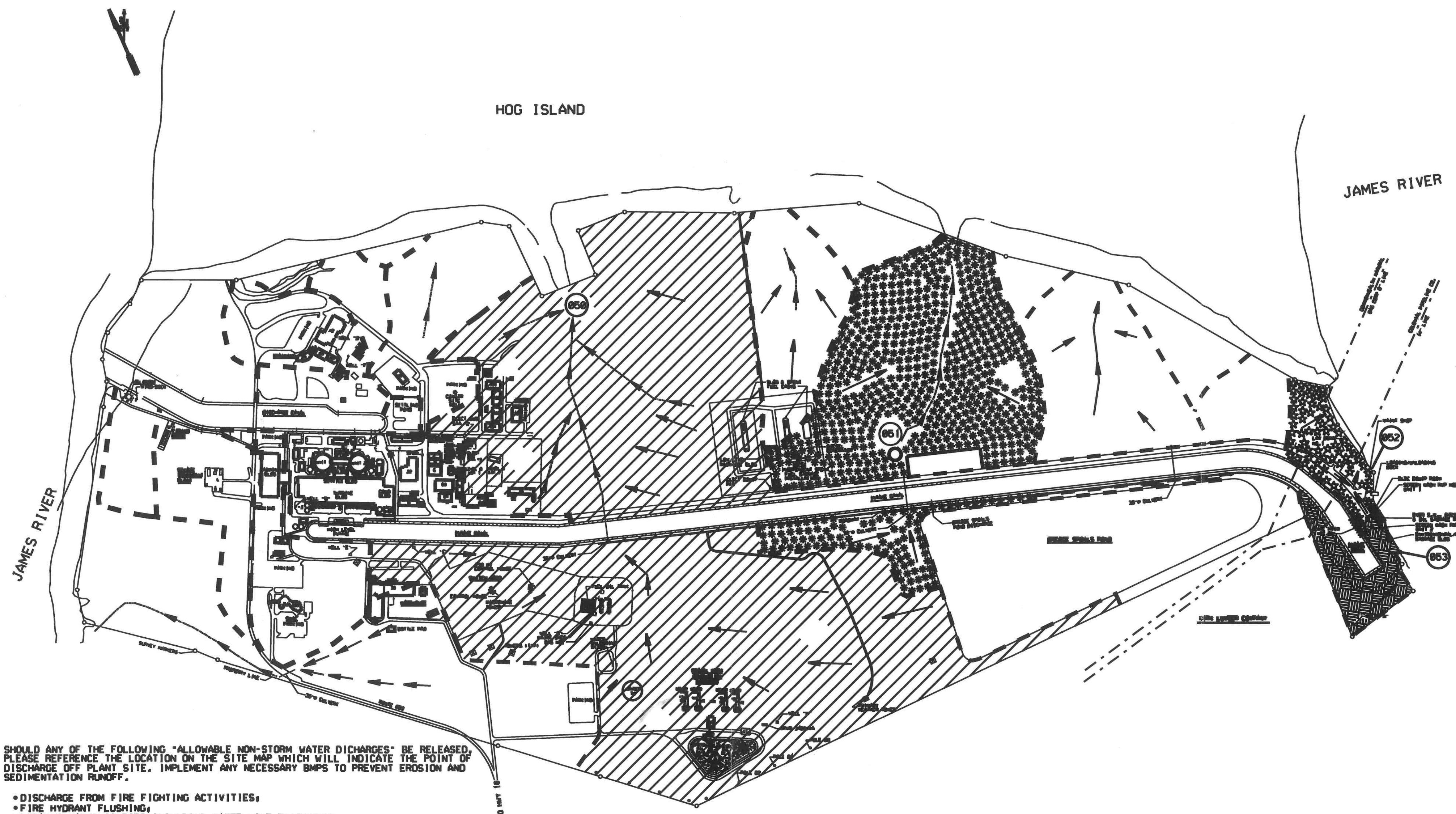



## Dominion Surry Power Station

### Location of Outfalls

0 mile | 0.25 mile | 0.5 mile

(Scale approximate)




SHOULD ANY OF THE FOLLOWING "ALLOWABLE NON-STORM WATER DICHARGES" BE RELEASED, PLEASE REFERENCE THE LOCATION ON THE SITE MAP WHICH WILL INDICATE THE POINT OF DISCHARGE OFF PLANT SITE. IMPLEMENT ANY NECESSARY BMPS TO PREVENT EROSION AND SEDIMENTATION RUNOFF.

- DISCHARGE FROM FIRE FIGHTING ACTIVITIES;
- FIRE HYDRANT FLUSHING;
- POTABLE WATER SOURCES INCLUDING WATER LINE FLUSHINGS;
- UNCONTAMINATED COMPRESSOR CONDENSATE;
- IRRIGATION DRAINAGE;
- LAWN WATERING;
- ROUTINE EXTERNAL BUILDING WASH DOWN THAT DOES NOT USE DETERGENTS OR OTHER COMPOUNDS;
- PAVEMENT WASH WATERS WHERE SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURED (UNLESS ALL SPILLED MATERIALS HAS BEEN REMOVED) AND WHERE DETERGENTS ARE NOT USED;
- AIR CONDITIONING CONDENSATE;
- UNCONTAMINATED SPRING WATER;
- UNCONTAMINATED GROUND WATER;
- FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH PROCESS MATERILS SUCH AS SOLVENTS; AND,
- INCIDENTAL WINDBLOWN MIST FROM COOLING TOWERS

LEGEND:

- STORMWATER OUTFALL 050 = TOTAL ESTIMATED AREA 272 ACRES, 15% IMPERVIOUS
- STORMWATER OUTFALL 051 = TOTAL ESTIMATED AREA 84 ACRES, 5% IMPERVIOUS
- STORMWATER OUTFALL 052 = TOTAL ESTIMATED AREA 10 ACRES, 10% IMPERVIOUS
- STORMWATER OUTFALL 053 = TOTAL ESTIMATED AREA 10 ACRES, 10% IMPERVIOUS

Dominion

NUCLEAR ENGINEERING
RICHMOND, VIRGINIA

# STORM WATER DRAINAGE MAP
# SURRY POWER STATION

CAD NO: DOMSPEC FOR FILE VERIFICATION

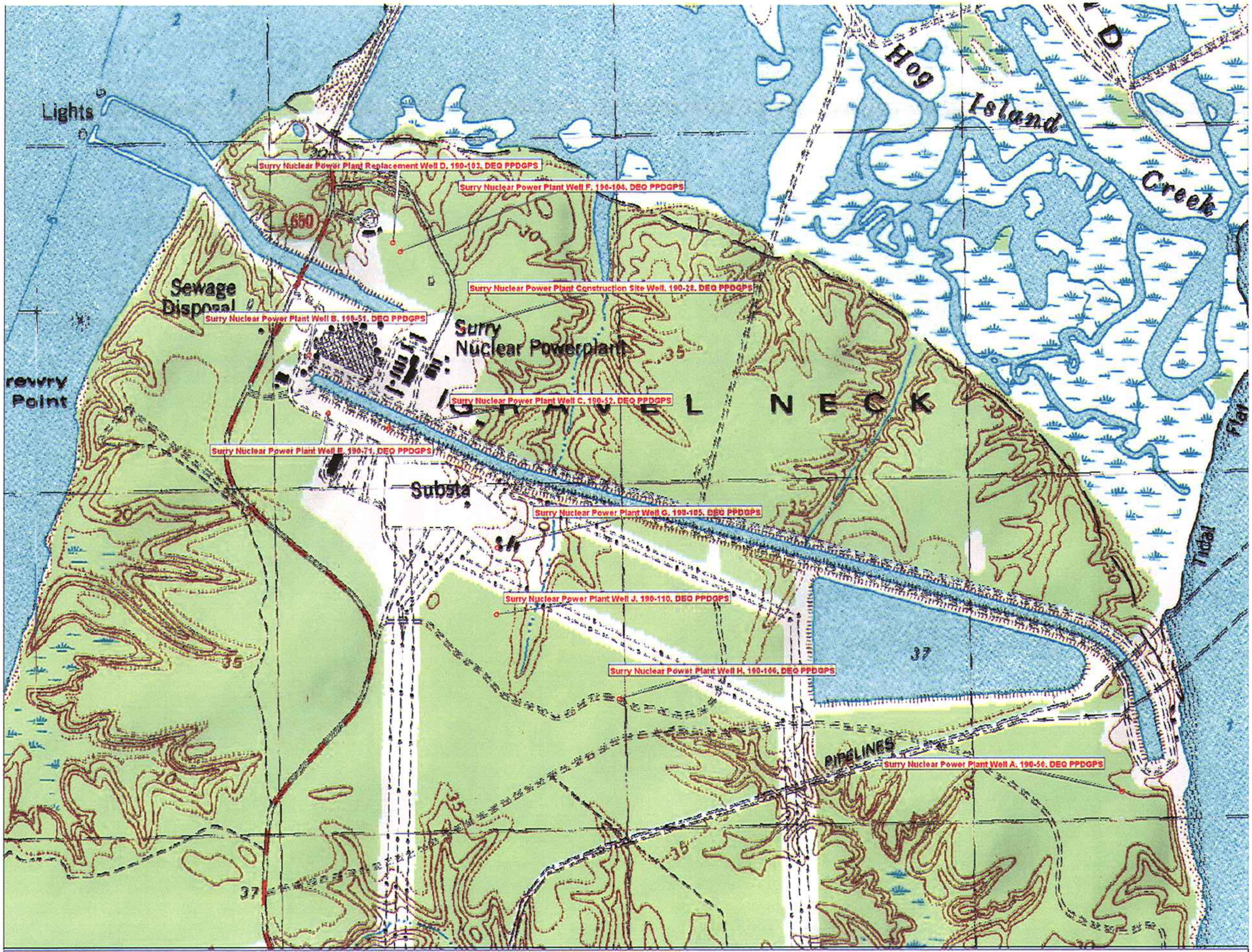
DRAWING NO: SU-0-SP-STA-622 REV 0

SCALE: 1" = 333'

UNLESS OTHERWISE NOTED SH 1 OF 1

DOMSPEC FOR FILE VERIFICATION

PRIOR TO USING FOR DESIGN WORK CHECK DMIS FOR WORK PENDING



Lights
Hog
Island
Creek
Sewage
Disposal
Surry
Nuclear Powerplant
rewry
Point
G R A V E L N E C K
Substa
PIPELINES
Tidal
Flat
650
Surry Nuclear Power Plant Replacement Well D. 190-103. DEQ PPDGPS
Surry Nuclear Power Plant Well F. 190-104. DEQ PPDGPS
Surry Nuclear Power Plant Construction Site Well. 190-28. DEQ PPDGPS
Surry Nuclear Power Plant Well B. 190-51. DEQ PPDGPS
Surry Nuclear Power Plant Well C. 190-52. DEQ PPDGPS
Surry Nuclear Power Plant Well E. 190-71. DEQ PPDGPS
Surry Nuclear Power Plant Well G. 190-105. DEQ PPDGPS
Surry Nuclear Power Plant Well J. 190-110. DEQ PPDGPS
Surry Nuclear Power Plant Well H. 190-106. DEQ PPDGPS
Surry Nuclear Power Plant Well A. 190-50. DEQ PPDGPS


DELORME

mapquest

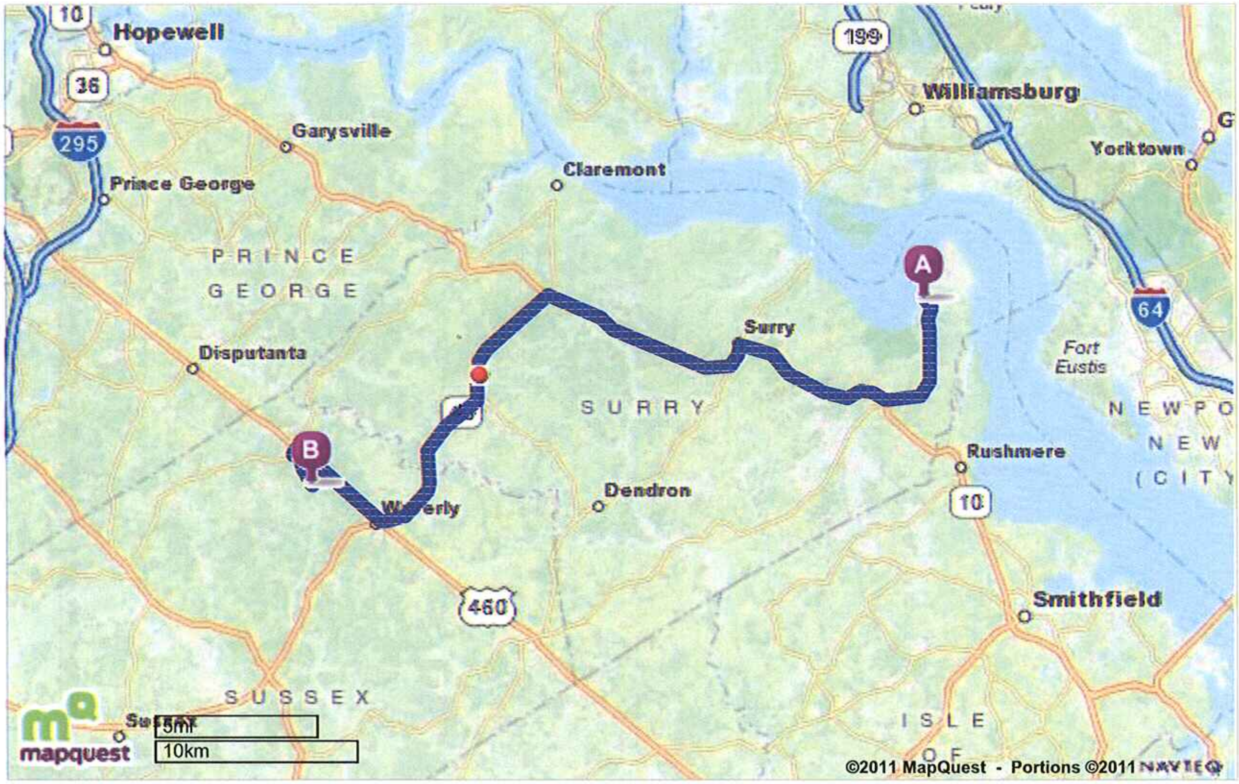
**Trip to:**
4385 Beef Steak Rd
Waverly, VA 23890-3727
**39.66 miles**
**55 minutes**

Notes

Sludge Haul Route From Surry Power Station's STP to Black Swamp Regional WWTP

| | **5570 Hog Island Rd** Surry, VA 23883-2022 | **Miles Per Section** | **Miles Driven** |
|---|---|---|---|
| | 1. Start out going SOUTH on HOG ISLAND RD toward LANDING DR. | **Go 4.2 Mi** | 4.2 mi |
| | 2. Turn RIGHT onto BACONS CASTLE TRL. *BACONS CASTLE TRL is 0.9 miles past ELLERSLIE DR* | **Go 1.4 Mi** | 5.5 mi |
| 10 | 3. Turn SHARP RIGHT onto COLONIAL TRL E / VA-10. *If you are on WHITE MARSH RD and reach HILLSIDE LN you've gone about 1.5 miles too far* | **Go 6.7 Mi** | 12.3 mi |
| 10 | 4. Turn LEFT onto VA-10 / VA-31 / ROLFE HWY. *VA-10 is just past CHURCH ST* | **Go 1.0 Mi** | 13.2 mi |
| | 5. Stay STRAIGHT to go onto COLONIAL TRL W. | **Go 7.9 Mi** | 21.2 mi |
| 40 | 6. Turn LEFT onto MARTIN LUTHER KING HWY / VA-40. Continue to follow VA-40. *If you reach IDLEWILD LN you've gone about 0.8 miles too far* | **Go 12.1 Mi** | 33.3 mi |
| 460 | 7. Turn RIGHT onto N COUNTY DR / US-460. Continue to follow US-460. *US-460 is just past SYLVAN RD* | **Go 4.5 Mi** | 37.8 mi |
| | 8. Turn LEFT onto CABIN POINT RD. *If you reach CABIN POINT PL you've gone about 0.1 miles too far* | **Go 0.3 Mi** | 38.1 mi |
| | 9. Turn LEFT onto BEEF STEAK RD. *If you reach ATLANTIC LN you've gone about 1.5 miles too far* | **Go 1.5 Mi** | 39.7 mi |
| | 10. 4385 BEEF STEAK RD is on the LEFT. *If you reach LOBBS SHOP RD you've gone about 0.7 miles too far* | | 39.7 mi |
| | **4385 Beef Steak Rd** Waverly, VA 23890-3727 | **39.7 mi** | **39.7 mi** |

Total Travel Estimate: **39.66 miles - about 55 minutes**



mapquest

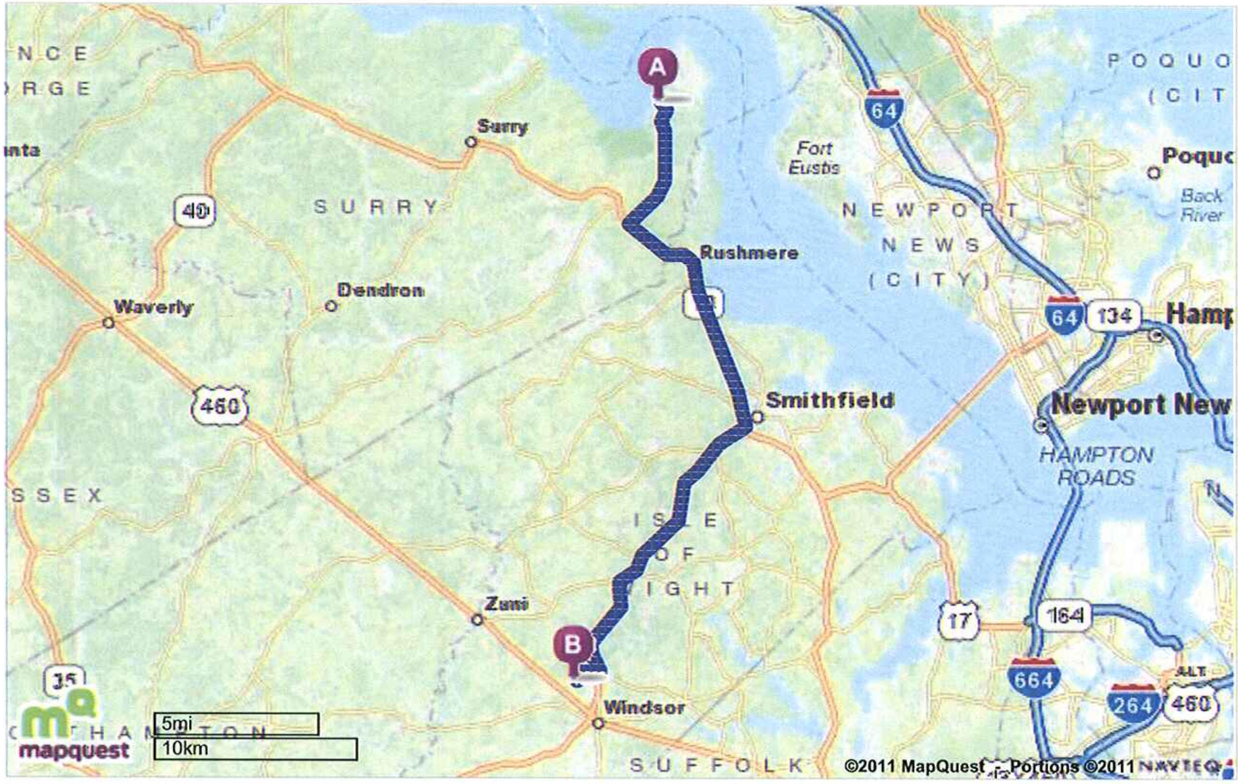
**Trip to:**
9330 Dinky Cir
Windsor, VA 23487-5237
**29.63 miles**
**42 minutes**

Notes

Sludge Haul Route From Surry Power Station's STP to Ducks Septage Lagoons

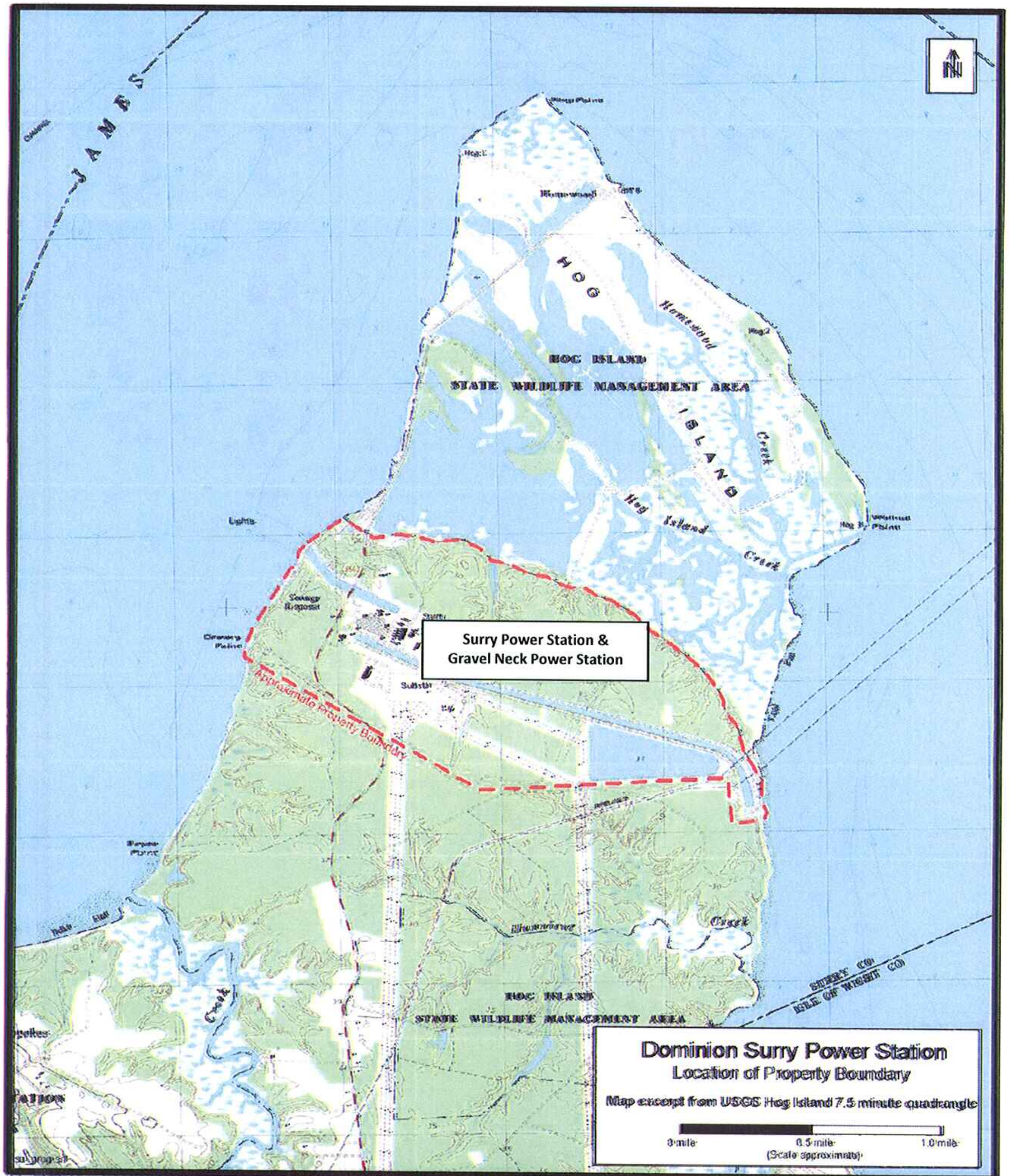
| | | Miles Per Section | Miles Driven |
|---|---|---|---|
| A | **5570 Hog Island Rd** Surry, VA 23883-2022 | | |
| | 1. Start out going SOUTH on HOG ISLAND RD toward LANDING DR. | **Go 5.6 Mi** | 5.6 mi |
| 10 | 2. Turn LEFT onto COLONIAL TRL E / VA-10. Continue to follow VA-10. *If you are on MOUNT RAY DR and reach MOUNT RAY CT you've gone about 0.7 miles too far* | **Go 10.0 Mi** | 15.6 mi |
| 258 | 3. Turn RIGHT onto US-258 / W MAIN ST. Continue to follow US-258. | **Go 12.6 Mi** | 28.2 mi |
| | 4. Turn RIGHT onto CUT THRU RD. *If you reach WINDSOR WAY you've gone about 0.6 miles too far* | **Go 1.0 Mi** | 29.2 mi |
| | 5. Take the 1st LEFT onto STAVE MILL RD. *If you reach GARRISON DR you've gone about 0.4 miles too far* | **Go 0.3 Mi** | 29.6 mi |
| | 6. Take the 2nd LEFT onto DINKY CIR. *If you reach WINDSOR BLVD you've gone about 0.8 miles too far* | **Go 0.07 Mi** | 29.6 mi |
| | 7. 9330 DINKY CIR is on the RIGHT. *Your destination is just past DUCKS LN* *If you reach STAVE MILL RD you've gone about 0.1 miles too far* | | 29.6 mi |
| B | **9330 Dinky Cir** Windsor, VA 23487-5237 | **29.6 mi** | **29.6 mi** |

Total Travel Estimate: **29.63 miles - about 42 minutes**



# Attachment C

Topographic Map and Aerial Photographs



JAMES
HOG ISLAND
STATE WILDLIFE MANAGEMENT AREA
HOG
ISLAND
Hog Island Creek
Surry Power Station &
Gravel Neck Power Station
Approximate Property Boundary
HOG ISLAND
STATE WILDLIFE MANAGEMENT AREA
SURRY CO
ISLE OF WIGHT CO
Dominion Surry Power Station
Location of Property Boundary
Map excerpt from USGS Hog Island 7.5 minute quadrangle
0 mile
0.5 mile
1.0 mile
(Scale approximate)


Hog Island
Image © 2012 Commonwealth of Virginia
© 2012 Google
©2009 Google
7469 ft
Imagery Date: Apr 7, 2010
lat 37.171284° lon -76.682171°
Eye alt 25828 ft
N

N
Hog Island Rd
2743 ft
© 2012 Google
©2009 Google
Imagery Date: Apr 7, 2010
lat 37.162485° lon -76.688848°
Eye alt 9488 ft

# Attachment D

Materials/Chemicals Used/Stored Onsite

## ITEM V.D. INTAKE & EFFLUENT CHARACTERIXTICS and ITEM VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

The backwash system associated with Surry's cooling water intake system results in a release of water back to the James River. Fish and small quantities of solids that accumulate on the screens may be present in these releases.

In 1994, DEQ approved the use of an antifouling coating Epco-Tek 2000 for application to the Emergency Service Water Pump suction inlets and inlets to the Component Cooling Heat Exchangers and the Intake Structure Trash Racks. Epco-Tek 2000 is no longer being manufactured. In the previous permit reissuance application, Surry requested, received DEQ's approval, and subsequently used a similar coating (an arc thermal spray copper/copper alloy coating). Surry plans to continue using this coating on intake and discharge structures that are particularly susceptible to biofouling. Surry is also exploring and requesting approval to use two commercially available and durable antifouling paints: Y3449F and Y5692 (See attached Material Safety Data Sheets). These coatings will be applied on an as needed basis. As with the use of the arc thermal spray copper/copper alloy coating, the application of Y3449F and Y5692 coatings is not expected to appreciably alter the copper concentrations in discharges from the Surry Power Station.

The following is a list of chemicals that are either in use or that may be used within the next five years at Surry Power Station.

| **CHEMICALS USED IN STEAM GENERATORS, SECONDARY GENERATORS, SECONDARY SYSTEMS, AND SERVICE WATER** | |
|---|---|
| Ammonium Chloride | Used to balance the Steam Generator molar ratio. |
| Hydrazine | Currently added to control oxygen. |
| Monoethanolamine (ETA) | Added to control pH. |
| Ammonium hydroxide | Formed in the system by hydrazine decomposition, and/or may be added for pH control. |
| Carbohydrazide $(N_2H_3)_2CO$ | May be used as a replacement for hydrazine. |
| Dimethylamine (DMA) | May be used for pH control. |
| Trimethylamine (TMA) | May be used for pH control and as a cleaning agent for steam generators. |
| Diaminoethane (DAE) | May be used for pH control. |
| 5-aminopentanol (5AP) | May be used for pH control. |
| Diethylaminoethanol | May be used for pH control. |
| 2-amino-2-methyl-1-propanol (AMP) | May be used for pH control. |
| Morpholine | May be used for pH control. |
| Diethylhydroxylamine (DEHA) | May be used for oxygen control. |
| Polyacrylic acid | May be used as a dispersant. |

| | |
|---|---|
| Methoxypropylamine (MPA) | May be used for pH control. |
| Hydrogen peroxide | Hydrazine neutralizer. |
| Sodium hypochlorite | Used for macro-fouling control in service water. |
| Sodium bromide | Used for macro-fouling control in service water. |
| Sulfuric acid | Used for regeneration of resin beds. |
| Anitfoulant coatings and arc thermal spray copper/copper alloy coating | May be used for biofouling control on intake and discharge equipment and structure. |
| Sodium hydroxide | Used for regeneration of resin beds. |
| **CHEMICALS ADDED TO THE AUXILIARY HEATING BOILER** | |
| Trisodium phosphate | Buffer/pH control. |
| Sodium sulfite | Oxygen control. |
| Sodium hydroxide | pH control. |
| Hydrazine | Oxygen control. |
| Carbohydrazide | May be used as a replacement for hyrazine. |
| Ammonium hydroxide | Formed in the system by hydrazine decomposition (pH control). |
| **CHEMICALS ADDED TO THE BEARING COOLING SYSTEM** | |
| Sodium nitrite | Present in corrosion inhibitor. |
| Borax | Present in corrosion inhibitor. |
| Sodium molybdate | May be used as a corrosion inhibitor. |
| Metaborate | Present in corrosion inhibitor. |
| Tolytriazole | Present in corrosion inhibitor. |
| Potassium hydroxide | pH control. |
| Gluteraldehyde | May be used as a biocide. |
| Isothiazolone | Biocide. |
| **CHEMICALS ADDED TO COMPONENT COOLING SYSTEM** | |
| Potassium hydroxide | pH control. |
| Potassium chromate | Corrosion inhibitor. |
| Potassium dichromate | Corrosion inhibitor. |
| Sodium nitrite | May be used as a corrosion inhibitor. |
| Tolytriazole | May be used as a corrosion inhibitor. |
| Isothiazolone | May be used as a biocide. |
| Sodium tetraborate | May be used as a corrosion inhibitor. |

| | |
|---|---|
| Sodium molybdate | Corrosion inhibitor. |
| Gluteraldehyde | Biocide. |
| **CHEMICALS ADDED TO OR FOUND IN THE SURRY RADWASTE FACILITY** | |
| Hydrochloric acid | RO Membrane cleaning |
| Sodium hydroxide | RO Membrane cleaning and pH Control |
| Boric acid | Added to primary water for reactivity control |
| Sulfuric acid | pH Control |
| Hydrogen peroxide | Added to primary water as for Oxygenation of system during shut down procedures |
| Lithium hydroxide | Added to primary water for pH Control |
| Zinc acetate | Added to primary water for reactivity control |
| Hydrazine | Added to primary water as Oxygen Scavenger |
| 544 Antifoam compound (Dow Corning) | Foam control |

The above chemicals may appear in internal discharges at low concentrations. All would be below detection levels in the final discharge Outfall 001.

Periodically, checks for condenser leaks may be performed using uranine yellow dye (disodium fluorescein) as an indicator. Concentrations used are in the range that would be perceptible only under UV light and would not be otherwise apparent in the cooling water discharge.

In addition to the above list, Surry Power Station uses numerous chemicals to operate and maintain its equipment, vehicles, and facilities. Examples of these chemicals include lubricants, cleaners, detergents, polishes, waxes, cleaners, cutting oils, sanitizers, paints, solvents, and protectants. The majority of these chemicals are managed in small containers, but some are managed in larger quantities. It is conceivable that these chemicals and chemical types could appear in discharges from the Surry Power Station at very low concentrations.

The following is a list of chemicals that are either in use, or that may be used within the next five years at Gravel Neck Power Station.

| **CHEMICALS USED DURING GAS COMPRESSOR WASH** | |
|---|---|
| Connect 600 | Cleaner |
| Dow Corning Antifoam 1410 | Antifoam |

# Attachment E

Ambient Data from Monitoring Stations 2-JMS041.27 & 2-JMS050.57

VA0004090 - Surry Power Station and Gravel Neck
Ambient data from Monitoring Station 2-JMS041.27

| Collection Date | Depth (meters) | Temperature (°C) | pH (SU) | Dissolved Oxygen: Probe (mg/L) | Dissolved Oxygen: Winkler (mg/L) | Dissolved Oxygen: Fdt Optical (mg/L) | Salinity (g/kg) |
|---|---|---|---|---|---|---|---|
| 7/22/1968 | 1 | 28.89 | 8.5 | | 15 | | |
| 9/8/1968 | 1 | 25.56 | 8.1 | | 8 | | |
| 3/20/1969 | 1 | 8.89 | 7.3 | | 10.39 | | |
| 6/19/1969 | 1 | 25 | 7.2 | | 6.7 | | |
| 10/2/1969 | 1 | 21.11 | 8.6 | | 6.2 | | |
| 2/16/1970 | 1 | 5.56 | 7.5 | | 12.19 | | |
| 4/21/1970 | 1 | 15 | 7.3 | | 9.4 | | |
| 5/5/1970 | 1 | 18.33 | 6.8 | | 6.8 | | |
| 6/17/1970 | 1 | 25 | 7.3 | | 7.8 | | |
| 7/1/1970 | 1 | 26.11 | 8 | | 8.2 | | |
| 7/24/1970 | 1 | 26.67 | 7.3 | | 6.8 | | |
| 8/14/1970 | 1 | 27.22 | 8.6 | | 6.2 | | |
| 9/22/1970 | 1 | 26.67 | 7.8 | | 8 | | |
| 5/11/1971 | 1 | 20 | 6.8 | | 8.2 | | |
| 6/14/1971 | 1 | 25.56 | 7.7 | | 6.8 | | |
| 7/6/1971 | 1 | 26.67 | 7 | | 7 | | |
| 7/23/1971 | 1 | 26.67 | 7.7 | | 6.8 | | |
| 8/3/1971 | 1 | 28.33 | 7.5 | | 7.8 | | |
| 8/31/1971 | 1 | 26.67 | 9 | | 8 | | |
| 9/26/1971 | 1 | 22.22 | 8 | | 7.6 | | |
| 10/27/1971 | 1 | 20 | 7 | | 6.4 | | |
| 6/12/1972 | 1 | 23.33 | 7.1 | | 7 | | |
| 7/24/1972 | 1 | 28.89 | 7.4 | | 7 | | |
| 8/17/1972 | 1 | 27.22 | 8 | | 7.2 | | |
| 8/25/1972 | 1 | 27.78 | 7.7 | | 7 | | |
| 9/27/1972 | 1 | 23.89 | 7.5 | | 6.4 | | |
| 10/12/1972 | 1 | 16.67 | 6.8 | | 7.4 | | |
| 5/24/1973 | 1 | 21.67 | 6.8 | | 7.4 | | |
| 6/6/1973 | 1 | 25.56 | 7.2 | | | | |
| 6/25/1973 | 1 | 27.78 | 7.7 | | 7.6 | | |
| 7/11/1973 | 1 | 28.89 | 7.7 | | 7.4 | | |
| 7/24/1973 | 1 | 27.22 | 7.5 | | 6.5 | | |
| 8/10/1973 | 1 | 28.89 | 7.5 | | 7 | | |
| 9/4/1973 | 1 | 31.11 | 7.8 | | 6.6 | | |
| 6/19/2007 | 0.3 | 29.3 | 7.8 | 8.7 | | | 2.3 |
| 8/2/2007 | 0.3 | 28.9 | 7.4 | 6.6 | | | 5.1 |
| 10/3/2007 | 0.3 | 27.8 | 7.4 | | | | 8.4 |
| 12/6/2007 | 0.3 | 5.6 | 7.7 | 12.2 | | | 6 |
| 2/6/2008 | 0.3 | 10.2 | 7.1 | | | 11.8 | 4.23 |
| 4/16/2008 | 0.3 | 15.7 | 7.7 | 9.9 | | | 0 |
| 6/18/2008 | 0.3 | 27.5 | 7.9 | 8.3 | | | 2.57 |
| 8/13/2008 | 0.3 | 26.5 | 7.5 | 6.3 | | | 7.3 |
| 10/14/2008 | 0.3 | 20.5 | 7.8 | 8.6 | | | 5.3 |
| 12/18/2008 | 0.3 | 9.1 | 7.6 | 12.1 | | | 1.65 |
| 1/12/2009 | 0.3 | 6.7 | 6.6 | 11.5 | | | 1.2 |
| 3/9/2009 | 0.3 | 10.2 | 8.3 | 13.2 | | | 3.5 |
| 5/13/2009 | 0.3 | 22.2 | 8 | 9.1 | | | 0 |
| 7/7/2009 | 0.3 | 27 | 7.9 | 8.4 | | | 1.84 |
| 9/16/2009 | 0.3 | 25.2 | 7.8 | | | 9 | 7.6 |
| 11/4/2009 | 0.3 | 15.6 | 7.6 | 9 | | | 6.4 |
| 2/11/2010 | 0.3 | 2.3 | | 12.4 | | | 0 |
| 4/20/2010 | 0.3 | 17 | 8.5 | 12.3 | | | 0 |
| 6/7/2010 | 0.3 | 25.9 | 8.1 | 8.8 | | | 0 |
| 8/16/2010 | 0.3 | 28.1 | 7.6 | 8 | | | 7.8 |
| 10/25/2010 | 0.3 | 16.8 | 7.4 | 8.8 | | | 5 |
| 12/8/2010 | 0.3 | 3.6 | 7.4 | 13.1 | | | 1.5 |
| **90th Percentile:** | | **28.9** | **8.2** | | | | |
| **10th Percentile:** | | **9.0** | **7.0** | | | | |
| **Average:** | | | | | | | **3.5** |

VA0004090 - Surry Power Station and Gravel Neck (2012 Permit)
Ambient Total Hardness as $CaCO_3$ from Monitoring Station 2-JMS050.57

| Collection Date | Depth (meters) | Total Hardness (mg/L AS $CaCO_3$) |
|---|---|---|
| 1/26/1994 | 1 | 48 |
| 2/17/1994 | 1 | 52 |
| 3/21/1994 | 1 | 39 |
| 4/14/1994 | 1 | 42 |
| 5/23/1994 | 1 | 80 |
| 6/9/1994 | 1 | 56 |
| 10/17/1994 | 1 | 383 |
| 11/30/1994 | 1 | 289 |
| 12/6/1994 | 1 | 137 |
| 1/25/1995 | 0.3 | 49 |
| 2/27/1995 | 0.3 | 70 |
| 3/23/1995 | 0.3 | 42 |
| 4/18/1995 | 0.3 | 68 |
| 5/23/1995 | 0.3 | 55 |
| 6/20/1995 | 0.3 | 43 |
| 7/18/1995 | 0.3 | 50 |
| 8/23/1995 | 0.3 | 388 |
| 9/21/1995 | 0.3 | 600 |
| 10/19/1995 | 0.3 | 420 |
| 11/20/1995 | 0.3 | 90 |
| 12/14/1995 | 0.3 | 60 |
| 1/29/1996 | 0.3 | 20 |
| 2/20/1996 | 0.3 | 54 |
| 3/25/1996 | 0.3 | 64 |
| 4/29/1996 | 0.3 | 47 |
| 5/15/1996 | 0.3 | 54 |
| 6/18/1996 | 0.3 | 57 |
| 7/23/1996 | 0.3 | 74 |
| 8/20/1996 | 0.3 | 58 |
| 9/24/1996 | 0.3 | 39 |
| 10/22/1996 | 0.3 | 49 |
| 11/19/1996 | 0.3 | 58 |
| 12/10/1996 | 0.3 | 42 |
| 1/21/1997 | 0.3 | 54.2 |
| 2/18/1997 | 0.3 | 47.3 |
| 3/18/1997 | 0.3 | 43.2 |
| 4/22/1997 | 0.3 | 55.7 |
| 5/28/1997 | 0.3 | 72.9 |
| 6/24/1997 | 0.3 | 54.8 |
| 7/15/1997 | 0.3 | 120 |
| 8/19/1997 | 0.3 | 154 |
| 9/23/1997 | 0.3 | 316 |
| 10/21/1997 | 0.3 | 623 |
| 11/18/1997 | 0.3 | 70.5 |
| 12/10/1997 | 0.3 | 301 |
| 1/21/1998 | 0.3 | 35.5 |
| 2/18/1998 | 0.3 | 48.5 |
| 3/17/1998 | 0.3 | 34.4 |
| 4/21/1998 | 0.3 | 41.7 |
| 5/19/1998 | 0.3 | 33.4 |
| 6/23/1998 | 0.3 | 48.5 |
| 7/21/1998 | 0.3 | 81.1 |
| 8/18/1998 | 0.3 | 245 |
| 9/22/1998 | 0.3 | 358 |
| 10/20/1998 | 0.3 | 564 |
| 11/18/1998 | 0.3 | 820 |
| 12/15/1998 | 0.3 | 702 |
| 1/19/1999 | 0.3 | 112 |
| 2/23/1999 | 0.3 | 66 |
| 3/23/1999 | 0.3 | 88 |
| 4/20/1999 | 0.3 | 54 |
| 5/20/1999 | 0.3 | 62 |
| 6/22/1999 | 0.3 | 284 |
| 7/20/1999 | 0.3 | 360 |
| 8/17/1999 | 0.3 | 586 |
| 9/21/1999 | 0.3 | 42.5 |
| 11/18/1999 | 1 | 67.2 |
| 12/21/1999 | 0.3 | 85.9 |
| 1/18/2000 | 0.3 | 75.2 |
| 2/23/2000 | 0.3 | 47 |
| 3/28/2000 | 0.3 | 51 |
| 4/24/2000 | 0.3 | 33 |
| 5/23/2000 | 0.3 | 45 |
| 6/20/2000 | 0.3 | 57.1 |
| 7/18/2000 | 0.3 | 54.6 |
| 8/22/2000 | 0.3 | 60.1 |

(cont.)

| Collection Date | Depth (meters) | Total Hardness (mg/L AS $CaCO_3$) |
|---|---|---|
| 9/26/2000 | 0.3 | 106 |
| 10/24/2000 | 1 | 269 |
| 11/28/2000 | 0.3 | 372 |
| 1/23/2001 | 0.3 | 169 |
| 2/20/2001 | 0.3 | 82.9 |
| 3/27/2001 | 0.3 | 28.6 |
| 4/24/2001 | 0.3 | 16.4 |
| 5/24/2001 | 0.3 | 64.3 |
| 6/19/2001 | 0.3 | 48.9 |
| 7/24/2001 | 0.3 | 224 |
| 8/21/2001 | 0.3 | 205 |
| 9/18/2001 | 0.3 | 544 |
| 10/16/2001 | 0.3 | 8650 |
| 11/27/2001 | 0.3 | 1281 |
| 12/12/2001 | 0.3 | 1189 |
| 1/22/2002 | 0.3 | 746 |
| 2/19/2002 | 0.3 | 417 |
| 3/19/2002 | 0.3 | 458 |
| 4/16/2002 | 0.3 | 90.5 |
| 5/30/2002 | 0.3 | 83.6 |
| 6/25/2002 | 0.3 | 241 |
| 7/23/2002 | 0.3 | 765 |
| 8/13/2002 | 0.3 | 795 |
| 9/24/2002 | 0.3 | 1184 |
| 10/22/2002 | 0.3 | 1162 |
| 11/19/2002 | 0.3 | 54.9 |
| 12/10/2002 | 0.3 | 48.2 |
| 1/21/2003 | 0.3 | 56.2 |
| 2/25/2003 | 0.3 | 37.4 |
| 3/18/2003 | 0.3 | 58.3 |
| 4/15/2003 | 0.3 | 25.1 |
| 5/27/2003 | 0.3 | 54.5 |
| 6/24/2003 | 0.3 | 47.6 |
| 7/15/2003 | 0.3 | 39 |
| 8/26/2003 | 0.3 | 41.6 |
| 9/24/2003 | 0.3 | 15.5 |
| 10/28/2003 | 0.3 | 50.1 |
| 11/18/2003 | 0.3 | 49 |
| 12/16/2003 | 0.3 | 48 |
| 2/25/2004 | 0.3 | 43.3 |
| 3/23/2004 | 0.3 | 52 |
| 4/20/2004 | 0.3 | 47.8 |
| 5/18/2004 | 0.3 | 54 |
| 6/15/2004 | 0.3 | 56 |
| 7/20/2004 | 0.3 | 37.3 |
| 8/17/2004 | 0.3 | 33.7 |
| 9/21/2004 | 0.3 | 51.9 |
| 10/19/2004 | 0.3 | 26 |
| 11/16/2004 | 0.3 | 65 |
| 12/14/2004 | 0.3 | 50 |
| 1/26/2005 | 0.3 | 42 |
| 2/15/2005 | 0.3 | 54 |
| 3/22/2005 | 0.3 | 58 |
| 4/19/2005 | 0.3 | 39.1 |
| 5/24/2005 | 0.3 | 50 |
| 6/21/2005 | 0.3 | 66 |
| 7/19/2005 | 0.3 | 84 |
| 8/23/2005 | 0.3 | 128 |
| 9/20/2005 | 0.3 | 336 |
| 10/18/2005 | 0.3 | 114 |
| 11/15/2005 | 0.3 | 380 |
| 12/21/2005 | 0.3 | 48 |
| 1/17/2006 | 0.3 | 56 |
| 2/21/2006 | 0.3 | 57 |
| 3/20/2006 | 0.3 | 74 |
| 4/26/2006 | 0.3 | 81 |
| 5/15/2006 | 0.3 | 65 |
| 6/29/2006 | 0.3 | 65 |
| 7/24/2006 | 0.3 | 74 |
| 8/22/2006 | 0.3 | 452 |
| 9/26/2006 | 0.3 | 74 |
| 10/30/2006 | 0.3 | 42 |
| 11/15/2006 | 0.3 | 49 |
| 1/24/2007 | 0.3 | 44 |
| | **Average:** | **224.7** |

## Attachment F

Facility Site Inspection

# VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

## Wastewater Facility Inspection Report

**Revised 08/2001**

| | | | |
|---|---|---|---|
| **Facility Name:** | Va Power – Surry Power Station | **Facility No.:** | VA0004090 |
| **City/County:** | Surry County | **Inspection Agency:** | DEQ |
| **Inspection Date:** | November 9, 2010 | **Date Form Completed:** | November 25, 2010 |
| **Inspector:** | Charles Stitzer | **Time Spent:** | 12 hrs. w/ travel & report |
| **Reviewed By:** | | **Unannounced Insp.?** | No |
| | | **FY-Scheduled Insp.?** | Yes |

**Present at Inspection:** Phyllis Wells and Ric Raper

**TYPE OF FACILITY:**

| Domestic | | Industrial | |
|---|---|---|---|
| [ ] Federal | [ ] Major | [x] Major | [ ] Primary |
| [x] Non-Federal | [ ] Minor | [ ] Minor | [ ] Secondary |

Population Served: approx.: N/A

Number of Connections: approx.: N/A

**TYPE OF INSPECTION:**

[x] Routine — Date of last inspection: February 12, 2009

[ ] Compliance — Agency: DEQ/PRO

[ ] Reinspection

**EFFLUENT MONITORING:**

**September 2010 at outfall 101 (sanitary wastewater treatment plant):** Flow:0.0246 MGD, $BOD_5$:<QL mg/L, TSS:<QL mg/L

Other: pH: 6.37/7.71 SU TRC:1.6 mg/l, Inst tech min.$Cl_2$: 1.6 mg/L Fecal Coliform: <QL

**CHANGES AND/OR CONSTRUCTION**

| | | | |
|---|---|---|---|
| DATA VERIFIED IN PREFACE | [ ] Updated | [x] No changes | |
| Has there been any new construction? | [ ] Yes* | [x] No | |
| If yes, were plans and specifications approved? | [ ] Yes | [ ] No* | [x] N/A |
| DEQ approval date: | N/A | | |

**(A) PLANT OPERATION AND MAINTENANCE**

1. Class and number of licensed operators: Class I – 0, Class II - 0 Class III - 4, Class IV – 0
2. Hours per day plant is staffed: WWTP: 8 hours/day, Power Plant: 24 hours/day
3. Describe adequacy of staffing: [x] Good [ ] Average [ ] Poor*
4. Does the plant have an established program for training personnel? [x] Yes [ ] No
5. Describe the adequacy of the training program: [x] Good [ ] Average [ ] Poor*
6. Are preventive maintenance tasks scheduled? [x] Yes [ ] No*
7. Describe the adequacy of maintenance: [x] Good [ ] Average [ ] Poor*
8. Does the plant experience any organic/hydraulic overloading? [x] Yes* [ ] No

   If yes, identify cause and impact on plant: Yes. "Outages" occur relatively frequently. These are times when significant maintenance or construction is performed at the electrical generating plant. These Outages require a significant increase of on-site staff, mostly temporary contractors. The WWTP operator has become skilled at adjusting the WWTP to anticipate the changing hydraulic/organic loads. The WWTP responds well to these changes and remains in compliance during the outages.

9. Any bypassing since last inspection? [ ] Yes* [x] No
10. Is the on-site electric generator operational? [x] Yes [ ] No* [ ] N/A
11. Is the STP alarm system operational? [x] Yes [ ] No * [ ] N/A
12. How often is the standby generator exercised? [x] Weekly [ ] Monthly [ ] Other:

    Power Transfer Switch? [x] Weekly [ ] Monthly [ ] Other:

    Alarm System? [ ] Weekly [ ] Monthly [x]Other: Daily
13. When were the cross connection control devices last tested on the potable water service? August 4, 2010
14. Is sludge disposed in accordance with the approved sludge disposal plan? [x] Yes [ ] No* [ ] N/A
15. Is septage received by the facility? [ ] Yes [x] No

    Is septage loading controlled? [ ] Yes [ ] No * [x] N/A

    Are records maintained? [ ] Yes [ ] No* [x] N/A
16. Overall appearance of facility: [x] Good [ ] Average [ ] Poor*

**Comments: #6 All equipment is scheduled for quarterly maintenance by the VADEN Group. #11 All alarms are telemetered to Nuclear Chemistry Office, the shift supervisor and the operator's enunciator panel.**

**(B) PLANT RECORDS**

1. Which of the following records does the plant maintain?

| | | | |
|---|---|---|---|
| Operational Logs for each unit process | [x] Yes | [ ] No* | [ ] N/A |
| Instrument maintenance and calibration | [x] Yes | [ ] No* | [ ] N/A |
| Mechanical equipment maintenance | [x] Yes | [ ] No* | [ ] N/A |
| Industrial waste contribution **(Municipal Facilities)** | [ ] Yes | [ ] No* | [x] N/A |

2. What does the operational log contain?

| | | | |
|---|---|---|---|
| Visual Observations | [x] Yes | [ ] No | [ ] N/A |
| Flow Measurement | [x] Yes | [ ] No | [ ] N/A |
| Laboratory Results | [x] Yes | [ ] No | [ ] N/A |
| Process Adjustments | [x] Yes | [ ] No* | [ ] N/A |
| Control Calculations | [x] Yes | [ ] No | [ ] N/A |
| Other: | | | |

3. What do the mechanical equipment records contain:

| | | | |
|---|---|---|---|
| As built plans and specs? | [x] Yes | [ ] No* | [ ] N/A |
| Spare parts inventory? | [x] Yes | [ ] No* | [ ] N/A |
| Manufacturers instructions? | [x] Yes | [ ] No* | [ ] N/A |
| Equipment/parts suppliers? | [x] Yes | [ ] No* | [ ] N/A |
| Lubrication schedules? | [x] Yes | [ ] No* | [ ] N/A |
| Other: | | | |
| Comments: | None | | |

4. What do the industrial waste contribution records contain: ***(Applicable to municipal facilities only)***

| | | | |
|---|---|---|---|
| Waste characteristics? | [ ] Yes | [ ] No* | [x] N/A |
| Locations and discharge types? | [ ] Yes | [ ] No* | [x] N/A |
| Impact on plant? | [ ] Yes | [ ] No* | [x] N/A |
| Other: | N/A | | |
| Comments: | None | | |

5. Are the following records maintained at the plant:

| | | | |
|---|---|---|---|
| Equipment maintenance records | [x] Yes | [ ] No* | [ ] N/A |
| Operational Log | [x] Yes | [ ] No* | [ ] N/A |
| Industrial contributor records | [ ] Yes | [ ] No* | [x] N/A |
| Instrumentation records | [x] Yes | [ ] No* | [ ] N/A |
| Sampling and testing records | [x] Yes | [ ] No* | [ ] N/A |

6. Are records maintained at a different location? [ ] Yes [x] No
   Where are the records maintained? All are available on site.

7. Were the records reviewed during the inspection? [x] Yes [ ] No

8. Are the records adequate and the O & M Manual current? [x] Yes [ ] No* [ ] N/A
   O&M Manual date written: submitted to VDH 10/5/88
   Date DEQ approved O&M: see "comments", below

9. Are the records maintained for required 3-year period? [x] Yes [ ] No*

**Comments: #1 – The VADEN Group manages the equipment records for maintenance that they perform. #8 O&M Manual update from most recent permit reissuance has been submitted and is under review.**

**(C) SAMPLING**

1. Are sampling locations capable of providing representative samples? [x] Yes [ ] No* [ ] N/A
2. Do sample types correspond to those required by the permit? [x] Yes [ ] No* [ ] N/A
3. Do sampling frequencies correspond to those required by the permit? [x] Yes [ ] No* [ ] N/A
4. Are composite samples collected in proportion to flow? [x] Yes [ ] No* [ ] N/A
5. Are composite samples refrigerated during collection? [x] Yes [ ] No* [ ] N/A
6. Does plant maintain required records of sampling? [x] Yes [ ] No* [ ] N/A
7. Does plant run operational control tests? [x] Yes [ ] No* [ ] N/A

**Comments:**

**(D) TESTING**

1. Who performs the testing? [x] Plant/ Lab (TSS, pH, TRC)
   [x] Central Lab – Dominion Resources: ($BOD_5$, O&G, TOC, Total N, TKN, Total P, organics and metals)
   [x] Commercial Lab – Name: **Coastal Bioanalysts – TMP**

***If plant performs any testing, complete 2-4.***

2. What method is used for chlorine analysis? HACH pocket colorimeter
3. Is sufficient equipment available to perform required tests? [x] Yes [ ] No* [ ] N/A
4. Does testing equipment appear to be clean and/or operable? [x] Yes [ ] No* [ ] N/A

**Comments: Please see enclosed DEQ *Laboratory Inspection Report*.**

**(E) FOR INDUSTRIAL FACILITIES W/ TECHNOLOGY BASED LIMITS N/A**

1. Is the production process as described in the permit application? (If no, describe changes in comments)

   [ ] Yes [ ] No* [x] N/A

2. Do products and production rates correspond to the permit application? (If no, list differences in comments section)

   [ ] Yes [ ] No* [x] N/A

3. Has the State been notified of the changes and their impact on plant effluent?

   [ ] Yes [ ] No* [x] N/A

**Comments: None**

**FOLLOW UP TO COMPLIANCE RECOMMENDATIONS FROM THE FEBRUARY 12, 2009 DEQ INSPECTION:**

There were no compliance recommendations generated from the February 12, 2009 Tech inspection.

**FOLLOW UP TO GENERAL RECOMMENDATIONS FROM THE FEBRUARY 12, 2009 DEQ INSPECTION:**

There were no general recommendations generated from the February 12, 2009 Tech inspection.

**INSPECTION REPORT SUMMARY**

**Compliance Recommendations/Request for Corrective Action:**

None

**General Recommendations/Observations:**

None

**Comments:**

Items evaluated during this inspection include (check all that apply):

| | | | |
|---|---|---|---|
| [x] Yes | [ ] No | | Operational Units |
| [ ] Yes | [x] No | | O & M Manual |
| [ ] Yes | [x] No | | Maintenance Records |
| [ ] Yes | [ ] No | [x] N/A | Pathogen Reduction & Vector Attraction Reduction |
| [ ] Yes | [x] No | [ ] N/A | Sludge Disposal Plan |
| [ ] Yes | [ ] No | [x] N/A | Groundwater Monitoring Plan |
| [ ] Yes | [x] No | [ ] N/A | Storm Water Pollution Prevention Plan |
| [x] Yes | [ ] No | [ ] N/A | Permit Special Conditions |
| [ ] Yes | [x] No | [ ] N/A | Permit Water Quality Chemical Monitoring |
| [x] Yes | [ ] No | [ ] N/A | Laboratory Records (see Lab Report) |

## UNIT PROCESS: OUTFALLS

**001:** This is the main discharge canal at the power station. Outfall 001 is sampled near the mouth of the canal. The majority of flow in the canal is once through non-contact cooling water. Water for non-contact cooling is pumped from the James River. At the intake, debris is collected on intake racks and removed for landfill disposal. Total Suspended Solids and pH are monitored at the intake. A double boom precautionary system is in place to collect excess foam, oil or debris. At the time of the inspection, high winds were causing foam that normally collects behind the booms to concentrate in 2 eddies in the canal; one upstream of the bridge and one downstream at the 101 outfall. Minimal foam was escaping to the James River.

The Outfall 001 canal also receives wastewater from Internal Outfalls 101 through 122.

**101:** STP - discharges to the discharge canal (See the following Unit Process Check Sheets.)

**102, 103, 106:**
Turbine building sumps A, B & C – Three 1300 g.p.m. pumps are used for emergency water removal from the basement of the turbine building. No discharge during the time of the inspection. These pumps are inside the plant and were not observed.

**104:** Reverse osmosis - Reject and backwash produced by the system is discharged through this outfall. The system is inside the plant and was not observed.

**105:** Station Oil Storage Tank AST containment - The valve is secured in the closed position, and posted with instructions for reporting and sampling procedures required in order to discharge. This facility is in the plant and was observed from the settling pond.

**107:** Package boiler blowdown, Units A & B - This unit is brought on-line as needed, about every four or five years, during steam operation. This unit discharges into a storm drain. This unit is inside the plant and was not observed.

**108:** Settling Pond - This thirty foot deep horseshoe shaped concrete basin receives wastewater from the low conductivity sump and four waste neutralization sumps within the power plant and RO reject and backwash from Gravel Neck. Sodium Hydroxide and Sulfuric Acid is used to neutralize the wastewater. The pond is equipped with four fixed mechanical aerators. A harbor boom is maintained in the second section of the pond to catch any floatables. Probiotics Total Treatment is used in the basin to enhance biological treatment in the pond. Effluent discharges over a concrete weir. Flow is measured in the weir box following the basin, using a conductive read rod with a $90^{o}$ v-notch weir. Flow is measured continuously.

**109:** Radioactive waste facility, ion exchange and ozonation. Laundry and liquid waste. The liquid waste is processed through an evaporator. The distillate is demineralized before being discharged. This facility is inside the plant and was not observed.

**110, 111, 112, 113:**
Waste Neutralization Sumps, Units 1A, 1B, 2A, 2B – The wastewater is discharged to the 108 Settling Pond or directly to Outfall 001.These facilities are inside the plant and were not observed.

**UNIT PROCESS: OUTFALLS continued**

**114, 115:**
Steam Generator Blow down, units 1 and 2 - These facilities are inside the plant and were not observed.

**116, 117:**
Recirculation Spray Heat Exchanger, Units 1 & 2 – These facilities are inside the plant and were not observed.

**118, 119:**
Condenser Hotwell drain, Units 1 & 2 - These facilities are inside the plant and were not observed.

**120:** Low Conductivity Sump – This unit discharges to the 108 Settling Basin or directly to Outfall 001. The facility is inside the plant and was not observed.

**121, 122:**
Steam Generator Hydrolaser Trailer, Units 1 & 2 – These units are used approximately every 18 months to clean the Steam Generator. The facilities are inside the plant and were not observed.

**002:** AST containment, gas turbine fuel. The AST facility is within a fenced, secured area. The release valve/Outfall is posted with instructions for reporting and sampling required in order to discharge. Outfall 002 discharges to an unnamed tributary of the James River (the only outfall that does not discharge to the Outfall 001 Canal.) There was no discharge at the time of the inspection.

**Gravel Neck Gas Turbine Facility** maintains a 2,000 gallon capacity wastewater holding tank. This tank is equipped with a high level, local audio and visual alarm signal. This facility has a VDH Pump and Haul Permit.

The facility also maintains and monitors 3 oil/water separator units. The largest of the three units (the "main separator) discharges at Outfall 108 (settling pond). The two smaller oil/water separator units discharge to the main separator. All three separators are equipped with local alarm signals to indicate high oil level conditions. All units are visually checked on a daily basis and pumped annually.

The Improvements at the entrance of the facility, mentioned in the last inspection report, appear to be working well. The improvements have served to stabilize an area previously susceptible to erosion and sedimentation.

**UNIT PROCESS: Sewage Pumping**

| | | | | |
|---|---|---|---|---|
| 1. | Name of station: | Main Pump Station | | |
| 2. | Location (if not at STP): | Training Center | | |
| 3. | Following equipment operable: | | | |
| | a. All pumps? | [x] Yes | [ ] No* | |
| | b. Ventilation? | [x] Yes | [ ] No* | [ ] N/A |
| | c. Control system? | [x] Yes | [ ] No* | [ ] N/A |
| | d. Sump pump? | [ ] Yes | [ ] No* | [x] N/A |
| | e. Seal water system? | [ ] Yes | [ ] No* | [x] N/A |
| 4. | Reliability considerations: | | | |
| | a. Class | [ ] I | [x] II | [ ] III |
| | b. Alarm system operable? | [x] Yes | [ ] No | [ ] N/A |
| | c. Alarm conditions monitored: | | | |
| | 1. high water level: | [x] Yes | [ ] No* | [ ] N/A |
| | 2. high liquid level in dry well: | [ ] Yes | [ ] No* | [x] N/A |
| | 3. main electric power: | [ ] Yes | [ ] No* | [x] N/A |
| | 4. auxiliary electric power: | [ ] Yes | [ ] No* | [x] N/A |
| | 5. failure of pump motors to start: | [ ] Yes | [ ] No* | [x] N/A |
| | 6. test function: | [x] Yes | [ ] No* | |
| | 7. other: | N/A | | |
| | d. Backup for alarm system operational? | [x] Yes | [ ] No* | [ ] N/A |
| | e. Alarm signal reported to (identify): | local audible & visual | | |
| | f. Continuous operability provisions: | | | |
| | 1. Generator hook up? | [ ] Yes | [x] No | |
| | 2. Two sources of electricity? | [x] Yes | [ ] No | |
| | 3. Portable pump? | [ ] Yes | [x] No | |
| | 4. 1 day storage? | [ ] Yes | [x] No | |
| | 5. other: | N/A | | |
| 5. | Does station have bypass? | [ ] Yes* | [x] No | |
| | a. Evidence of bypass use? | [ ] Yes* | [ ] No | [x] N/A |
| | b. Can bypass be disinfected? | [ ] Yes | [ ] No* | [x] N/A |
| | c. Can bypass be measured? | [ ] Yes | [ ] No* | [x] N/A |
| 6. | How often is station checked? | 1/week | | |
| 7. | General condition: | [x] Good | [ ] Fair | [ ] Poor* |

**Comments: #4.e and #6, the pump station is adjacent to the training building so it is visible to plant staff in the area. It can also be seen and is monitored by the guard tower that is staffed 24 hours a day.**

**UNIT PROCESS: Flow Measurement**

**[x] Influent [ ] Intermediate [ ] Effluent**

1. Type measuring device: 3' Parshall Flume w/ ultrasonic sensor, readout and totalizer

2. Present reading: Not recorded GPM

3. Bypass channel? [ ] Yes [x] No

   Metered? [ ] Yes [ ] No* [x] N/A

4. Return flows discharged upstream from meter? [ ] Yes [x] No

   If Yes, identify: N/A

5. Device operating properly? [x] Yes [ ] No*

6. Date of last calibration: 06/14/2010

7. Evidence of following problems:

   a. Obstructions? [ ] Yes* [x] No

   b. Grease? [ ] Yes* [x] No

8. General condition: [x] Good [ ] Fair [ ] Poor*

**Comments:**

**UNIT PROCESS: Flow Equalization**

1. Type of unit: [x] In-line [ ] Side-line [ ] Spill Pond
   Number of cells: 1
   Number of cells in operation: 1

2. What unit process does it precede? Aeration basin via flow measurement

3. Is volume adequate? [x] Yes [ ] No

4. Type of mixing: [ ] None [x] Diffused air [ ] Fixed Mechanical [ ] Floating mechanical

5. Condition of mixing equipment: [x] Good [ ] Average [ ] Poor*

6. How drawn off?
   a. Pumped from: [ ] Surface [x] Sub-surface [ ] Adjustable [ ] N/A
   b. Weir: [ ] Surface [ ] Sub-surface [x] N/A

7. What is the condition of the containment structure? [x] Good [ ] Fair [ ] Poor*

8. Are the facilities to flush solids and grease from basin walls adequate? [ ] Yes [ ] No* [x] N/A

9. Are there facilities for withdrawing floating material and foam? [ ] Yes [x] No

10. How are solids removed? [x] Drain down [ ] Drag line [ ] Other:
    Is it adequate? [x] Yes [ ] No*

11. Is the emergency overflow in good condition? [ ] Yes [ ] No* [x] N/A

12. Are the depth gauges in good condition? [ ] Yes [ ] No [x] N/A

13. General condition: [x] Good [ ] Fair [ ] Poor*

**Comments: The EQ basin is bypassed during normal operation of the plant. During outages or as otherwise necessary, it operates as an in-line EQ basin. When it is in use, all flow entering the plant flows to it, prior to being pumped to the aeration basin. Two blowers provide aeration; They are scheduled to run 15 minutes on and 45 minutes off; alternating with each cycle. The high level alarm on the tank has a local audible/visual signal and telemetry to the lab building and Chemistry Department Shift Supervisor.**

**UNIT PROCESS: Screening/Comminution**

| | | | | |
|---|---|---|---|---|
| 1. | Number of units: | Manual: 1 | | Mechanical: 1 |
| | Number of units in operation: | Manual: 0 | | Mechanical: 1 |
| 2. | Bypass channel provided? | [x] Yes | [ ] No | |
| | Bypass channel in use? | [ ] Yes | [x] No | [ ] N/A |
| 3. | Area adequately ventilated? | [x] Yes | [ ] No* | |
| 4. | Alarm system for equipment failure or overloads? | [x] Yes | [ ] No | [ ] N/A |
| | If present, is the alarm system operational? | [x] Yes | [ ] No * | [ ] N/A |
| 5. | Proper flow-distribution between units? | [ ] Yes | [ ] No * | [x] N/A |
| 6. | How often are units checked and cleaned? | twice a day | | |
| 7. | Cycle of operation: | continuous | | |
| 8. | Volume of screenings removed: | very little trash is removed from the comminutor | | |
| 9. | General condition: | [x] Good | [ ] Fair | [ ] Poor* |

**Comments: This unit consists of a comminutor and a bypass barscreen. The comminutor automatically reverses when a jam occurs; it will continue to reverse until it frees up.**

**UNIT PROCESS: Activated Sludge Aeration**

1. Number of units: 3
   Number of units in operation: 3

2. Mode of operation: Extended Aeration

3. Proper flow distribution between units? [x] Yes [ ] No* [ ] N/A

4. Foam control operational? [x] Yes [ ] No* [ ] N/A

5. Scum control operational? [x] Yes [ ] No* [ ] N/A

6. Evidence of the following problems:
   a. Dead spots? [ ] Yes* [x] No
   b. Excessive foam? [ ] Yes* [x] No
   c. Poor aeration? [ ] Yes* [x] No
   d. Excessive aeration? [ ] Yes* [x] No
   e. Excessive scum? [ ] Yes* [x] No
   f. Aeration equipment malfunction? [ ] Yes* [x] No
   g. Other:

7. Mixed liquor characteristics (as available) **NOT RECORDED THIS INSPECTION. VISUAL INSPECTION OF THE AERATION BASIN INDICATED SLIGHTLY DARKER THAN AVERAGE COLOR AND GOOD SETTLING CHARACTERISTICS. EFFLUENT WAS CLEAR**

| | | | |
|---|---|---|---|
| pH: | | MLSS: | |
| DO: | | SDI: | |
| SVI: | | Color: | Dark Brown |
| Odor: | Normal (not objectionable) | Settleability: | |
| | | Other: | |

8. Return/waste sludge:
   a. return rate: Not monitored, air lift return runs with aeration blowers
   b. waste rate: ~10,000 gallons each month (more during outages)
   c. frequency of wasting: 1/wk on avg., (more frequent wasting is necessary outages.

9. Aeration system control: [x] Time Clock [ ] Manual [ ] Continuous [ ] Other

10. Effluent control devices working properly ***(oxidation ditches)***? [ ] Yes [ ] No [x] N/A

11. General condition: [x] Good [ ] Fair [ ] Poor *

## UNIT PROCESS: Activated Sludge Aeration

1. Number of units: 3
   Number of units in operation: 3

2. Mode of operation: Extended Aeration

3. Proper flow distribution between units? [x] Yes [ ] No* [ ] N/A

4. Foam control operational? [x] Yes [ ] No* [ ] N/A

5. Scum control operational? [x] Yes [ ] No* [ ] N/A

6. Evidence of the following problems:
   a. Dead spots? [ ] Yes* [x] No
   b. Excessive foam? [ ] Yes* [x] No
   c. Poor aeration? [ ] Yes* [x] No
   d. Excessive aeration? [ ] Yes* [x] No
   e. Excessive scum? [ ] Yes* [x] No
   f. Aeration equipment malfunction? [ ] Yes* [x] No
   g. Other:

**Comments: This system is made up of three parallel trains. A splitter box precedes the aeration basins. Each basin is followed by its own clarifier.**
**#7 Process control analysis results were not recorded this inspection. However, the process control schedule and baseline targets are as follows:**
**Daily/As Needed: DO, pH aeration, pH clarifiers, Effluent Turbidity**
**Weekly: MLSS, Settleability, SVI, SDI, and wasting.**
**Influent analysis: BOD, COD, TP, TN, ALK, Fe, Ammonia and TSS.**
**Approximate Baselines: DO=1ppm**
**MLSS=2000-3000(non-outage)**
**SVI=100-150**
**SDI=0.8-1.0**

**UNIT PROCESS: Sedimentation**

**[ ] Primary [x] Secondary [ ] Tertiary**

1. Number of units: 3

   In operation: 3

2. Proper flow-distribution between units? [x] Yes [ ] No* [ ] N/A

3. Signs of short-circuiting and/or overloads? [ ] Yes* [x] No

4. Effluent weirs level? [x] Yes [ ] No* [ ] N/A

   Clean? [x] Yes [ ] No*

5. Scum collection system working properly? [x] Yes [ ] No* [ ] N/A

6. Sludge-collection system working properly? [x] Yes [ ] No* [ ] N/A

7. Influent, effluent baffle systems working properly? [x] Yes [ ] No* [ ] N/A

8. Chemical addition? [ ] Yes [x] No

   Chemicals: none

9. Effluent characteristics: clear

10. General condition: [x] Good [ ] Fair [ ] Poor*

**Comments: Sludge is returned via air lift system that operates when the blowers are on. A sluice gate in the return trough is opened to waste to the digester. Although this airlift system is often problematic in other systems, Mr. Raper's attention to regular maintenance has kept this system operating without typical clogging or degraded flows.**

## UNIT PROCESS: Aerobic Digestion

1. Number of units: 3

   Number of units in operation: 3

2. Type of sludge treated: [ ] Primary [x] WAS [ ] Other:

3. Frequency of sludge application to digesters: ~1/week

4. Supernatant return rate: As needed, overflow return to aeration basin

5. pH adjustment provided? [ ] Yes [x] No

   Utilized: [ ] Yes [ ] No [x] N/A

6. Tank contents well-mixed and relatively free of odors? [x] Yes [ ] No*

7. If diffused aeration is used, do diffusers require frequent cleaning? [ ] Yes [x] No [ ] N/A

8. Location of supernatant return: [ ] Head [ ] Primary [x] Other aeration basiin

9. Process control testing: **N/A**

   a. percent volatile solids: [ ] Yes ________ % [x]No

   b. pH: [ ] Yes ________ SU [x] No

   c. alkalinity: [ ] Yes ________ mg/L [x] No

   d. dissolved oxygen: [ ] Yes ________ mg/L [x] No

10. Foaming problem present? [ ] Yes * [x] No

11. Signs of short-circuiting or overloads?: [ ] Yes * [x] No

12. General condition: [x] Good [ ] Fair [ ] Poor*

**Comments: The sludge in the digesters is pumped out approximately 1/mo., more frequently during outages.**

**UNIT PROCESS: Drying Beds**

1. Number of units: 3

   Number of units in operation: 0

   Number of beds with sludge: 0

2. Cover in good condition? [ ] Yes [ ] No [x] N/A

3. Typical sand depth in beds: ~ 12 inches

4. Typical drying time: N/A (beds are not used)

5. Frequency of usage: N/A

6. Underflow recycle location: Aeration Basins

7. Sludge distributed evenly across bed(s)? [ ] Yes [ ] No* [x] N/A

8. Following problems noted:

   a. Odors? [ ] Yes* [x] No

   b. Flies? [ ] Yes* [x] No

   c. Weed growth? [ ] Yes* [x] No

   d. Leakage from bed(s)? [ ] Yes* [x] No

9. If the facility does not have an approved sludge plan, what is the current method of sludge disposal?

   The approved plan calls for pump and haul of the disgested sludge.

10. General condition: [x] Good [ ] Fair [ ] Poor*

**Comments: The beds are used for back up sludge control.**

**UNIT PROCESS: Chlorination**

| | | |
|---|---|---|
| 1. | Number of chlorinators: | 2 |
| | Number in operation: | 2 |
| 2. | Number of evaporators: | 0 |
| | Number in operation: | 0 |
| 3. | Number of chlorine contact tanks: | 2 |
| | Number in operation: | 1 |
| 4. | Proper flow-distribution between units? | [x] Yes [ ] No * [ ] N/A |
| 5. | How is chlorine introduced into the wastewater? | [ ] Perforated diffusers<br>[ ] Injector with single entry point<br>[X] Other Tablet feed |
| 6. | Chlorine residual in basin effluent: | Not checked mg/L |
| 7. | Applied chlorine dosage: | 3 stocked tubes in each chlorinator |
| 8. | Contact basins adequately baffled? | [x] Yes [ ] No * [ ] N/A |
| 9. | Adequate ventilation in: | |
| | a. Chemical storage area? | [ ] Yes [ ] No * [x] N/A |
| | b. Equipment room? | [ ] Yes [ ] No * [x] N/A |
| 10. | Proper safety precautions used? | [x] Yes [ ] No * |
| 11. | General condition: | [x] Good [ ] Fair [ ] Poor* |

**Comments: Flow from each of the clarifiers combines in a diverter box prior to the chlorine contact tank. The tanks are pumped out at least annually.**

**UNIT PROCESS: Flow Measurement**

**[ ] Influent [ ] Intermediate [x] Effluent**

| | | | | |
|---|---|---|---|---|
| 1. | Type measuring device: | $90^0$ V-notch weir with display and totalizer | | |
| 2. | Present reading: | Not recorded GPM | | |
| 3. | Bypass channel? | [ ] Yes | [x] No | |
| | Metered? | [ ] Yes | [ ] No* | [x] N/A |
| 4. | Return flows discharged upstream from meter? | [ ] Yes | [x] No | |
| | If Yes, identify: | N/A | | |
| 5. | Device operating properly? | [x] Yes | [ ] No* | |
| 6. | Date of last calibration: | 06/14/2010 | | |
| 7. | Evidence of following problems: | | | |
| | a. Obstructions? | [ ] Yes* | [x] No | |
| | b. Grease? | [ ] Yes* | [x] No | |
| 8. | General condition: | [x] Good | [ ] Fair | [ ] Poor* |

**Comments:**

**UNIT PROCESS: Effluent/Plant Outfall**

1. Type outfall: [X] Shore based [ ] Submerged

2. Type if shore based: [ ] Wingwall [X] Headwall [ ] Rip Rap [ ] N/A

3. Flapper valve? [ ] Yes [x] No

4. Erosion of bank? [ ] Yes* [x] No [ ] N/A

5. Effluent plume visible? [ ] Yes * [x] No

**Comments: The WWTP Outfall 101 discharges to the Outfall 001 Discharge Canal.**

6. Condition of outfall and supporting structures: [x] Good [ ] Fair [ ] Poor *

7. Final effluent, evidence of following problems:

   a. Oil sheen? [ ] Yes* [x] No

   b. Grease? [ ] Yes* [x] No

   c. Sludge bar? [ ] Yes* [x] No

   d. Turbid effluent? [ ] Yes* [x] No

   e. Visible foam? [ ] Yes* [x] No

   f. Unusual odor? [ ] Yes* [x] No

**Comments: Good quality, clear effluent (as seen at chlorinator).**

cc:

[x] Owner: c/o Phyllis Wells

[x] Operator: Richard A. Raper

[x] DEQ - Regional Office File

[x] EPA - Region III

# Attachment G

Effluent Screening Data, Form 2C Data, and DMR Data

# Surry Power Station and Gravel Neck - VA0004090
# Effluent Screening Test Results and Limitation Evaluation Results - 2012 Permit Reissuance

## Identification of Pollutants of Concern

| | |
|---|---|
| (pink) | Reported concentration is greater than QL. STATS evaulation and/or human health comparison conducted. |
| (blue) | Reported less than a QL that is greater than the DEQ-recommended QL for that pollutant. STATS evaluation and/or human health comparison conducted treating the QL as a real effluent concentration value. |
| (purple) | Reported concentration is greater than QL, but there is either no comparison value, or any available comparison values are not applicable to the discharge. |

## Determination of Need for Permit Limitations

| | |
|---|---|
| (orange) | Limitation is needed based on reasonable potential analysis |
| (yellow) | Limitation is needed based on direct comparison to human health WLA |
| (gray) | Limitation evaluation is unnecessary, or value is not applicable to the discharge. |

| CASRN | CHEMICAL | REQUIRED EPA ANALYSIS NO. | RECOMM. QL (µg/L) | TESTING REQUIRED IN ATT A: | Data Reported by Permittee: Outfall 001 | Outfall 002 | Outfall 101 |
|---|---|---|---|---|---|---|---|
| | | | | | ( **µg/L** *unless otherwise noted* ) | | |
| | **METALS (DISSOLVED)** | | | | | | |
| | Aluminum, dissolved | -- | -- | | <90 | <90 | |
| 7440-36-0 | Antimony, dissolved | (3) | 1.4 | √ | <1 | <1 | |
| 7440-38-2 | Arsenic, dissolved | (3) | 1.0 | √ | <3 | 26 | |
| 7440-39-3 | Barium, dissolved | (3) | 200 | √ (PWS) | 62 | 173 | |
| | Berylium, dissolved | -- | -- | | <0.2 | <0.02 | |
| | Boron, dissolved | -- | -- | | | | |
| 7440-43-9 | Cadmium, dissolved | (3) | 0.3 | √ | <0.3 | <0.03 | |
| 16065-83-1 | Chromium III, dissolved | (3) | 3.6 | √ | <1 | 3 | |
| 18540-29-9 | Chromium VI, dissolved | (3) | 1.6 | √ | <5 | <5 | |
| | Cobolt, dissolved | -- | -- | | <0.6 | <0.06 | |
| 7440-50-8 | Copper, dissolved | (3) | 0.50 | √ | 2 | 8 | |
| 7439-89-6 | Iron, dissolved | (3) | 30 | √ (PWS) | <50 | 13 | |
| 7439-92-1 | Lead, dissolved | (3) | 0.50 | √ | <1 | <1 | |
| | Magnesium, dissolved | -- | -- | | 304000 | 49 | |
| 7439-96-5 | Manganese, dissolved | (3) | 5.0 | √ (PWS) | <20 | <20 | |
| 7439-97-6 | Mercury, dissolved | (3) | 1.0 | √ | <0.2 | <0.02 | |
| | Molybdenum, dissolved | -- | -- | | 2 | <1 | |
| 7440-02-0 | Nickel, dissolved | (3) | 0.94 | √ | <5 | <5 | |
| 7782-49-2 | Selenium, dissolved | (3) | 2.0 | √ (SW) | <3 | <3 | |
| 7440-22-4 | Silver, dissolved | (3) | 0.20 | √ | <0.1 | <0.01 | |
| 7440-28-0 | Thallium, dissolved | (4) | (5) | √ | 6.2 | <0.02 | |
| | Tin, dissolved | -- | -- | | <5 | <5 | |
| | Titanium, dissolved | -- | -- | | <2 | <2 | |
| 7440-66-6 | Zinc, dissolved | (3) | 2.0 | √ | <10 | 37 | |
| | **METALS (TOTAL RECOVERABLE)** | | | | | | |
| | Aluminum, total recoverable | -- | -- | | <90 | <90 | <90 |
| | Antimony, total recoverable | -- | -- | | <1 | <1 | <1 |
| | Arsenic, total recoverable | -- | -- | | <3 | 26 | <3 |
| | Barium, total recoverable | -- | -- | | 77 | 1770 | <16 |
| | Berylium, total recoverable | -- | -- | | <0.2 | <2 | <0.2 |
| | Boron, total recoverable | -- | -- | | 840 | <20 | 760 |
| | Cadmium, total recoverable | -- | -- | | 0.6 | <3 | <3 |
| | Chromium, total recoverable | -- | -- | | 1 | 3 | <1 |
| | Cobolt, total recoverable | -- | -- | | <0.6 | <0.1 | <6 |

| CHEMICAL | 2012 **Wasteload Allocations** for Pollutants of Concern ( **µg/L** *unless otherwise noted* ): Outfall 001 Acute | Outfall 001 Chronic | Outfall 001 HH (PWS) | Outfall 001 HH | Outfall 002 Acute | Outfall 002 Chronic | Outfall 002 HH (PWS) | Outfall 002 HH |
|---|---|---|---|---|---|---|---|---|
| **METALS (DISSOLVED)** | | | | | | | | |
| Aluminum, dissolved | | | | | | | | |
| Antimony, dissolved | | | | | | | | |
| Arsenic, dissolved | 99 | 52 | 10 | -- | 340 | 150 | 10 | -- |
| Barium, dissolved | -- | -- | 2000 | -- | -- | -- | 2000 | -- |
| Berylium, dissolved | | | | | | | | |
| Boron, dissolved | | | | | | | | |
| Cadmium, dissolved | | | | | | | | |
| Chromium III, dissolved | | | | | 180 | 24 | 100 | -- |
| Chromium VI, dissolved | 23 | 16 | -- | -- | 16 | 11 | -- | -- |
| Cobolt, dissolved | | | | | | | | |
| Copper, dissolved | 13 | 8.7 | 1300 | -- | 3.6 | 2.7 | 1300 | -- |
| Iron, dissolved | -- | -- | 300 | -- | -- | -- | 300 | -- |
| Lead, dissolved | 340 | 13 | 15 | -- | 20 | 2.3 | 15 | -- |
| Magnesium, dissolved | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese, dissolved | -- | -- | 50 | -- | -- | -- | 50 | -- |
| Mercury, dissolved | | | | | | | | |
| Molybdenum, dissolved | -- | -- | -- | -- | | | | |
| Nickel, dissolved | 110 | 12 | 610 | 7000 | 56 | 6.3 | 610 | 4600 |
| Selenium, dissolved | 29 | 7.3 | 170 | 6400 | | | | |
| Silver, dissolved | | | | | | | | |
| Thallium, dissolved | -- | -- | 0.24 | 0.71 | | | | |
| Tin, dissolved | | | | | | | | |
| Titanium, dissolved | | | | | | | | |
| Zinc, dissolved | 130 | 120 | 7400 | 40000 | 36 | 36 | 7400 | 26000 |
| **METALS (TOTAL RECOVERABLE)** | | | | | | | | |
| Aluminum, total recoverable | | | | | | | | |
| Antimony, total recoverable | | | | | | | | |
| Arsenic, total recoverable | | | | | 340 | 150 | 10 | -- |
| Barium, total recoverable | -- | -- | 2000 | -- | -- | -- | 2000 | -- |
| Berylium, total recoverable | | | | | | | | |
| Boron, total recoverable | -- | -- | -- | -- | | | | |
| Cadmium, total recoverable | 27 | 4.9 | 5 | -- | | | | |
| Chromium, total recoverable | 23 | 16 | 100 | -- | 180 | 24 | 100 | -- |
| Cobolt, total recoverable | | | | | | | | |

## Identification of Pollutants of Concern

| | |
|---|---|
| (pink) | Reported concentration is greater than QL. STATS evaulation and/or human health comparison conducted. |
| (blue) | Reported less than a QL that is greater than the DEQ-recommended QL for that pollutant. STATS evaluation and/or human health comparison conducted treating the QL as a real effluent concentration value. |
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## Determination of Need for Permit Limitations

| | |
|---|---|
| (orange) | Limitation is needed based on reasonable potential analysis |
| (yellow) | Limitation is needed based on direct comparison to human health WLA |
| (gray) | Limitation evaluation is unnecessary, or value is not applicable to the discharge. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outfall 001 | Outfall 002 | Outfall 101 | Outfall 001 | | | | Outfall 002 | | | |
| | | | | | | | | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH |
| | Copper, total recoverable | -- | -- | | 4 | 8 | 9 | 13 | 8.7 | 1300 | -- | 3.6 | 2.7 | 1300 | -- |
| | Cyanide, total recoverable | -- | 10 (free cyanide) | | <5 | <10 | <5 | | | | | | | | |
| | Iron, total recoverable | -- | -- | | 950 | 17.5 | <50 | -- | -- | 300 | -- | -- | -- | 300 | -- |
| | Lead, total recoverable | -- | -- | | <1 | <1 | <1 | | | | | | | | |
| | Magnesium, total recoverable | -- | -- | | 309000 | 520 | 5220 | -- | -- | -- | -- | -- | -- | -- | -- |
| | Manganese, total recoverable | -- | -- | | 100 | <20 | <20 | -- | -- | 50 | -- | | | | |
| | Mercury, total recoverable | -- | -- | | <0.2 | <0.2 | <0.2 | | | | | | | | |
| | Molybdenum, total recoverable | -- | -- | | 3 | <1 | 30 | -- | -- | -- | -- | -- | -- | -- | -- |
| | Nickel, total recoverable | -- | -- | | <5 | <5 | <5 | | | | | | | | |
| 7782-49-2 | Selenium, total recoverable | (3) | 2.0 | √ (FW) | <3 | <3 | <3 | | | | | 20 | 5 | 170 | 4200 |
| | Silver, total recoverable | -- | -- | | <0.1 | <0.1 | <0.1 | | | | | | | | |
| | Thallium, total recoverable | -- | -- | | 8.1 | <0.2 | <0.2 | -- | -- | 0.24 | 0.71 | | | | |
| | Tin, total recoverable | -- | -- | | <5 | <5 | <5 | | | | | | | | |
| | Titanium, total recoverable | -- | -- | | <12 | <2 | <5 | | | | | | | | |
| | Total Phenolic Compounds | -- | -- | | 30 | 50 | 40 | -- | -- | 10000 | 1300000 | -- | -- | 10000 | 860000 |
| | Zinc, total recoverable | -- | -- | | 10 | 42 | 61 | 130 | 120 | 7400 | 40000 | 36 | 36 | 7400 | 26000 |
| | PESTICIDES/PCB'S | | | | | | | | | | | | | | |
| 309-00-2 | Aldrin | 608 | 0.05 | √ | <0.016 | <0.016 | | | | | | | | | |
| 959-98-8 | Alpha-Endosulfan | 608 | 0.1 | √ | <0.014 | <0.014 | | | | | | | | | |
| 33213-65-9 | Beta-Endosulfan | 608 | 0.1 | √ | <0.017 | <0.017 | | | | | | | | | |
| 57-74-9 | Chlordane | 608 | 0.2 | √ | <0.014 | <0.014 | | | | | | | | | |
| 2921-88-2 | Chlorpyrifos (Dursban) | (4) | (5) | √ | <1 | <0.2 | | | | | | | | | |
| 72-54-8 | DDD | 608 | 0.1 | √ | <0.021 | <0.021 | | | | | | | | | |
| 72-55-9 | DDE | 608 | 0.1 | √ | <0.017 | <0.017 | | | | | | | | | |
| 50-29-3 | DDT | 608 | 0.1 | √ | <0.017 | <0.017 | | | | | | | | | |
| 8065-48-3 | Demeton | (4) | (5) | √ | <1 | <1 | | | | | | | | | |
| 333-41-5 | Diazinon | (4) | (5) | √ | <1 | <1 | | | | | | | | | |
| 60-57-1 | Dieldrin | 608 | 0.1 | √ | <0.01 | <0.01 | | | | | | | | | |
| 1031-07-8 | Endosulfan Sulfate | 608 | 0.1 | √ | <0.009 | <0.009 | | | | | | | | | |
| 72-20-8 | Endrin | 608 | 0.1 | √ | <0.02 | <0.02 | | | | | | | | | |
| 7421-93-4 | Endrin Aldehyde | (4) | (5) | √ | <0.019 | <0.019 | | | | | | | | | |
| 86-50-0 | Guthion | (4) | (5) | √ | <1 | <1 | | | | | | | | | |
| 76-44-8 | Heptachlor | 608 | 0.05 | √ | <0.05 | <0.016 | | | | | | | | | |
| 1024-57-3 | Heptachlor Epoxide | (4) | (5) | √ | <0.1 | <0.012 | | | | | | | | | |
| 143-50-0 | Kepone | (9) | (5) | √ | <0.1 | <0.015 | | | | | | | | | |
| 121-75-5 | Malathion | (4) | (5) | √ | <1 | <1 | | | | | | | | | |
| 72-43-5 | Methoxychlor | (4) | (5) | √ | <0.1 | <0.017 | | | | | | | | | |
| 2385-85-5 | Mirex | (4) | (5) | √ | <0.1 | <0.015 | | | | | | | | | |
| 56-38-2 | Parathion | (4) | (5) | √ | <1 | <1 | | | | | | | | | |

## Identification of Pollutants of Concern

| | |
|---|---|
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## Determination of Need for Permit Limitations

| | |
|---|---|
| (orange) | Limitation is needed based on reasonable potential analysis |
| (yellow) | Limitation is needed based on direct comparison to human health WLA |
| (gray) | Limitation evaluation is unnecessary, or value is not applicable to the discharge. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outfall 001 | Outfall 002 | Outfall 101 | Outfall 001 | | | | Outfall 002 | | | |
| | | | | | | | | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH |
| 1336-36-3 | PCB Total | 608 | 7 | √ | <7 | <7 | | | | | | | | | |
| 12674-11-2 | PCB-1016 | 608 | 1 | | <1 | <1 | | | | | | | | | |
| 11104-28-2 | PCB-1221 | 608 | 1 | | <1 | <1 | | | | | | | | | |
| 11131-16-5 | PCB-1232 | 608 | 1 | | <1 | <1 | | | | | | | | | |
| 53469-21-9 | PCB-1242 | 608 | 1 | | <1 | <1 | | | | | | | | | |
| 12672-29-6 | PCB-1248 | 608 | 1 | | <1 | <1 | | | | | | | | | |
| 11097-69-1 | PCB-1254 | 608 | 1 | | <1 | <1 | | | | | | | | | |
| 11096-82-5 | PCB-1260 | 608 | 1 | | <1 | <1 | | | | | | | | | |
| 8001-35-2 | Toxaphene | 608 | 5 | √ | <5 | <0.057 | | | | | | | | | |
| 319-84-6 | α BHC | -- | -- | | <0.007 | <0.007 | | | | | | | | | |
| 319-85-7 | β BHC | -- | -- | | <0.017 | <0.017 | | | | | | | | | |
| 58-89-9 | γ BHC | -- | -- | | <0.013 | <0.013 | | | | | | | | | |
| 319-86-8 | δ BHC | -- | -- | | <0.015 | <0.015 | | | | | | | | | |
| BASE NEUTRAL EXTRACTABLES | | | | | | | | | | | | | | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 625 | 10 | √ | <7.9 | <7.9 | | | | | | | | | |
| 95-50-1 | 1,2-Dichlorobenzene | 624 | 10 | √ | <4 | <4 | | | | | | | | | |
| 122-66-7 | 1,2-Diphenylhydrazine | (4) | (5) | √ | <8.8 | <8.8 | | | | | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | 624 | 10 | √ | <3.1 | <3.1 | | | | | | | | | |
| 106-46-7 | 1,4-Dichlorobenzene | 624 | 10 | √ | <4.4 | <4.4 | | | | | | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 625 | 10 | √ | <5.7 | <5.7 | | | | | | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | -- | -- | | <3.4 | <3.4 | | | | | | | | | |
| 91-58-7 | 2-Chloronaphthalene | (4) | (5) | √ | <4.6 | <4.6 | | | | | | | | | |
| 91-94-1 | 3,3-Dichlorobenzidine | (4) | (5) | √ | <16.5 | <16.5 | | | | | | | | | |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | -- | -- | | <3 | <3 | | | | | | | | | |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | -- | -- | | <4.2 | <4.2 | | | | | | | | | |
| 83-32-9 | Acenaphthene | 625 | 10 | √ | <3 | <3 | | | | | | | | | |
| 208-96-8 | Acenaphthylene | -- | -- | | <3.5 | <3.5 | | | | | | | | | |
| 120-12-7 | Anthracene | 625 | 10 | √ | <1.9 | <1.9 | | | | | | | | | |
| 92-87-5 | Benzidine | (4) | (5) | √ | <63 | <63 | | | | | | | | | |
| 56-55-3 | Benzo (a) anthracene | 625 | 10 | √ | <7.8 | <7.8 | | | | | | | | | |
| 50-32-8 | Benzo (a) pyrene | 625 | 10 | √ | <2.5 | <2.5 | | | | | | | | | |
| 205-99-2 | Benzo (b) fluoranthene (synonym | 625 | 10 | √ | <4.8 | <4.8 | | | | | | | | | |
| 191-24-2 | Benzo (GHI) Perylene | -- | -- | | <4.1 | <4.1 | | | | | | | | | |
| 207-08-9 | Benzo (k) fluoranthene | 625 | 10 | √ | <2.5 | <2.5 | | | | | | | | | |
| 111-44-4 | Bis (2-Chloroethyl) Ether | (4) | (5) | √ | <5.7 | <5.7 | | | | | | | | | |
| 108-60-1 | Bis (2-Chloroisopropyl) Ether | (4) | (5) | √ | <5.7 | <5.7 | | | | | | | | | |
| 111-91-1 | Bis (2-Cloroethoxy) Methane | -- | -- | | <5.3 | <5.3 | | | | | | | | | |
| 117-81-7 | Bis-2-ethylhexyl phthalate | 625 | 10 | √ | <2.5 | <2.5 | | | | | | | | | |

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|---|---|
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| CASRN | CHEMICAL | REQUIRED EPA ANALYSIS NO. | RECOMM. QL (µg/L) | TESTING REQUIRED IN ATT A: | Data Reported by Permittee ( **µg/L** *unless otherwise noted* ) | | | 2012 **Wasteload Allocations** for Pollutants of Concern ( **µg/L** *unless otherwise noted* ) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outfall 001 | Outfall 002 | Outfall 101 | Outfall 001 | | | | Outfall 002 | | | |
| | | | | | | | | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH |
| 85-68-7 | Butyl benzyl phthalate | 625 | 10 | √ | <2.5 | <2.5 | | | | | | | | | |
| 218-01-9 | Chrysene | 625 | 10 | √ | <2.5 | <2.5 | | | | | | | | | |
| 53-70-3 | Dibenz(a,h)anthracene | 625 | 20 | √ | <2.5 | <2.5 | | | | | | | | | |
| 84-74-2 | Dibutyl phthalate (synonym = Di-n- | 625 | 10 | √ | <6.4 | <6.4 | | | | | | | | | |
| 84-66-2 | Diethyl phthalate | 625 | 10 | √ | <7.4 | <7.4 | | | | | | | | | |
| 131-11-3 | Dimethyl phthalate | (4) | (5) | √ | <7.5 | <7.5 | | | | | | | | | |
| 117-84-0 | Di-n-octyl phthalate | -- | -- | | <2.5 | <2.5 | | | | | | | | | |
| 206-44-0 | Fluoranthene | 625 | 10 | √ | <2.2 | <2.2 | | | | | | | | | |
| 86-73-7 | Fluorene | 625 | 10 | √ | <2.2 | <2.2 | | | | | | | | | |
| 118-74-1 | Hexachlorobenzene | (4) | (5) | √ | <3.1 | <3.1 | | | | | | | | | |
| 87-68-3 | Hexachlorobutadiene | (4) | (5) | √ | <1.8 | <1.8 | | | | | | | | | |
| 77-47-4 | Hexachlorocyclopentadiene | (4) | (5) | √ | <10 | <10 | | | | | | | | | |
| 67-72-1 | Hexachloroethane | (4) | (5) | √ | <2.4 | <2.4 | | | | | | | | | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 625 | 20 | √ | <3.7 | <3.7 | | | | | | | | | |
| 78-59-1 | Isophorone | 625 | 10 | √ | <5.1 | <5.1 | | | | | | | | | |
| 91-20-3 | Naphthalene | -- | -- | | <3.8 | <3.8 | | | | | | | | | |
| 98-95-3 | Nitrobenzene | 625 | 10 | √ | <4.2 | <4.2 | | | | | | | | | |
| 62-75-9 | N-Nitrosodimethylamine | (4) | (5) | √ | <2.7 | <2.7 | | | | | | | | | |
| 621-64-7 | N-Nitrosodi-n-propylamine | (4) | (5) | √ | <3.6 | <3.6 | | | | | | | | | |
| 86-30-6 | N-Nitrosodiphenylamine | (4) | (5) | √ | <6.2 | <6.2 | | | | | | | | | |
| 85-01-8 | Phenanthrene | -- | -- | | <5.4 | <5.4 | | | | | | | | | |
| 129-00-0 | Pyrene | 625 | 10 | √ | <3.8 | <3.8 | | | | | | | | | |
| VOLATILES | | | | | | | | | | | | | | | |
| | 1,1,1-Trichloroethane | -- | -- | | <3.8 | <3.8 | | | | | | | | | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | (4) | (5) | √ | <6.9 | <6.9 | | | | | | | | | |
| 79-00-5 | 1,1,2-Trichloroethane | (4) | (5) | √ | <1.2 | <1.2 | | | | | | | | | |
| | 1,1-Dichloroethane | -- | -- | | <4.7 | <4.7 | | | | | | | | | |
| 75-35-4 | 1,1-Dichloroethylene | 624 | 10 | √ | <2.8 | <2.8 | | | | | | | | | |
| 156-60-5 | 1,2 Transdichloroethylene | -- | -- | | <1.6 | <1.6 | | | | | | | | | |
| 107-06-2 | 1,2-Dichloroethane | 624 | 10 | √ | <2.8 | <2.8 | | | | | | | | | |
| 78-87-5 | 1,2-Dichloropropane | (4) | (5) | √ | <6 | <6 | | | | | | | | | |
| 156-60-5 | 1,2-trans-dichloroethylene | (4) | (5) | √ | <1.6 | <1.6 | | | | | | | | | |
| 542-75-6 | 1,3-Dichloropropene (1,3- | (4) | (5) | √ | <5.9 | <5.9 | | | | | | | | | |
| | 2-Chloro-Ethylvinyl Ether | -- | -- | | <1.2 | <1.2 | | | | | | | | | |
| 107-02-8 | Acrolein | (4) | (5) | √ | <10 | <10 | | | | | | | | | |
| 107-13-1 | Acrylonitrile | (4) | (5) | √ | <1.5 | <1.5 | | | | | | | | | |
| 71-43-2 | Benzene | 624 | 10 | √ | <4.4 | <4.4 | | | | | | | | | |
| 75-25-2 | Bromoform | 624 | 10 | √ | <4.7 | <4.7 | | | | | | | | | |
| 56-23-5 | Carbon Tetrachloride | 624 | 10 | √ | <2.8 | <2.8 | | | | | | | | | |

## Identification of Pollutants of Concern

| | |
|---|---|
| | Reported concentration is greater than QL. STATS evaulation and/or human health comparison conducted. |
| | Reported less than a QL that is greater than the DEQ-recommended QL for that pollutant. STATS evaluation and/or human health comparison conducted treating the QL as a real effluent concentration value. |
| | Reported concentration is greater than QL, but there is either no comparison value, or any available comparison values are not applicable to the discharge. |

## Determination of Need for Permit Limitations

| | |
|---|---|
| | Limitation is needed based on reasonable potential analysis |
| | Limitation is needed based on direct comparison to human health WLA |
| | Limitation evaluation is unnecessary, or value is not applicable to the discharge. |

| CASRN | CHEMICAL | REQUIRED EPA ANALYSIS NO. | RECOMM. QL (µg/L) | TESTING REQUIRED IN ATT A: | Data Reported by Permittee | | | 2012 **Wasteload Allocations** for Pollutants of Concern ( **µg/L** *unless otherwise noted* ) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outfall 001 | Outfall 002 | Outfall 101 | Outfall 001 | | | | Outfall 002 | | | |
| | | | | | ( **µg/L** *unless otherwise noted* ) | | | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH |
| 108-90-7 | Chlorobenzene (synonym = | 624 | 50 | √ | <6 | <6 | | | | | | | | | |
| 124-48-1 | Chlorodibromomethane | 624 | 10 | √ | <3.1 | <3.1 | | | | | | | | | |
| | Chloroethane | -- | -- | | <1.1 | <1.1 | | | | | | | | | |
| 67-66-3 | Chloroform | 624 | 10 | √ | <1.6 | <1.6 | | | | | | | | | |
| 75-27-4 | Dichlorobromomethane | 624 | 10 | √ | <2.2 | <2.2 | | | | | | | | | |
| 75-71-8 | Dichlorodifluoromethane | -- | -- | | | | | | | | | | | | |
| 75-09-2 | Dichloromethane (synonym = | 624 | 20 | √ | <2.8 | <2.8 | | | | | | | | | |
| 100-41-4 | Ethylbenzene | 624 | 10 | √ | <2.7 | <2.7 | | | | | | | | | |
| 74-83-9 | Methyl Bromide | (4) | (5) | √ | <1.4 | <1.4 | | | | | | | | | |
| 75-87-3 | Methyl Chloride | -- | -- | | <1.1 | <1.1 | | | | | | | | | |
| 75-09-2 | Methylene Chloride | -- | -- | | <2.8 | <2.8 | | | | | | | | | |
| 127-18-4 | Tetrachloroethylene | 624 | 10 | √ | <4.1 | <4.1 | | | | | | | | | |
| 10-88-3 | Toluene | 624 | 10 | √ | <6 | <6 | | | | | | | | | |
| 79-01-6 | Trichloroethylene | 624 | 10 | √ | <1.9 | <1.9 | | | | | | | | | |
| 75-69-4 | Trichlorofluoromethane | -- | -- | | <2.3 | <2.3 | | | | | | | | | |
| 75-01-4 | Vinyl Chloride | 624 | 10 | √ | <1.8 | <1.8 | | | | | | | | | |
| ACID EXTRACTABLES | | | | | | | | | | | | | | | |
| 120-83-2 | 2,4 Dichlorophenol | 625 | 10 | √ | <5.6 | <5.6 | | | | | | | | | |
| 105-67-9 | 2,4 Dimethylphenol | 625 | 10 | √ | <5.2 | <5.2 | | | | | | | | | |
| 88-06-2 | 2,4,6-Trichlorophenol | 625 | 10 | √ | <2.7 | <2.7 | | | | | | | | | |
| 51-28-5 | 2,4-Dinitrophenol | (4) | (5) | √ | <42 | <42 | | | | | | | | | |
| 95-57-8 | 2-Chlorophenol | 625 | 10 | √ | <3.3 | <3.3 | | | | | | | | | |
| 534-52-1 | 2-Methyl-4,6-Dinitrophenol (4,6 | (4) | (5) | √ | <24 | <24 | | | | | | | | | |
| 88-75-5 | 2-Nitrophenol | -- | -- | | <3.6 | <3.6 | | | | | | | | | |
| 100-02-7 | 4-Nitrophenol | -- | -- | | <2.4 | <2.4 | | | | | | | | | |
| 25154-52-3 | Nonylphenol | (5) | (5) | √ | <10 | <10 | | | | | | | | | |
| 59-50-7 | P-Chloro-M-Cresol | -- | -- | | <7.5 | <7.5 | | | | | | | | | |
| 87-86-5 | Pentachlorophenol | 625 | 50 | √ | <3.6 | <3.6 | | | | | | | | | |
| 108-95-2 | Phenol | 625 | 10 | √ | <2.7 | <2.7 | | | | | | | | | |
| RADIONUCLIDES | | | | | | | | | | | | | | | |
| | Beta Particle & Photon Activity | (4) | (5) | √ (PWS) | 44.9 pCi/L | <1.62 pCi/L | 23 pCi/L | | | 4 mrem/yr | | | | | |
| | Gross Alpha Particle Activity (pCi/L) | (4) | (5) | √ (PWS) | <36.7 pCi/L | <1.93 pCi/L | <3.19 pCi/L | | | 15 pCi/L | | | | | |
| | Combined Radium 226 and 228 | (4) | (5) | √ (PWS) | 1.06 pCi/L | | | | | 5 pCi/L | | | | | |
| | Uranium | (4) | (5) | √ (PWS) | | | | | | | | | | | |
| | Tritium | -- | -- | | <227 pCi/L | <208 pCi/L | | | | | | | | | |
| | Strontium-90 | -- | -- | | <1.13 pCi/L | <0.645 pCi/L | | | | | | | | | |
| MISCELLANEOUS | | | | | | | | | | | | | | | |
| 776-41-7 | Ammonia as NH3-N (mg/L) | 350.1 | 0.2 | √ | 0.07 | 0.02 | 0.09 | 4.67 | 0.707 | -- | -- | 50.5 | 2.98 | -- | -- |

## Identification of Pollutants of Concern

| | |
|---|---|
| (pink) | Reported concentration is greater than QL. STATS evaulation and/or human health comparison conducted. |
| (blue) | Reported less than a QL that is greater than the DEQ-recommended QL for that pollutant. STATS evaluation and/or human health comparison conducted treating the QL as a real effluent concentration value. |
| (purple) | Reported concentration is greater than QL, but there is either no comparison value, or any available comparison values are not applicable to the discharge. |

## Determination of Need for Permit Limitations

| | |
|---|---|
| (orange) | Limitation is needed based on reasonable potential analysis |
| (yellow) | Limitation is needed based on direct comparison to human health WLA |
| (gray) | Limitation evaluation is unnecessary, or value is not applicable to the discharge. |

| CASRN | CHEMICAL | REQUIRED EPA ANALYSIS NO. | RECOMM. QL (µg/L) | TESTING REQUIRED IN ATT A: | Data Reported by Permittee ( **µg/L** *unless otherwise noted* ) | | | 2012 **Wasteload Allocations** for Pollutants of Concern ( **µg/L** *unless otherwise noted* ) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outfall 001 | Outfall 002 | Outfall 101 | Outfall 001 | | | | Outfall 002 | | | |
| | | | | | | | | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH |
| 16887-00-6 | Chlorides (mg/L) | (4) | (5) | √ (FW & PWS) | 4215.04 | 2.66 | | | | | | 860 | 230 | 250 | |
| 7782-50-5 | Chlorine, Total Residual | (4) | 0.1 | √ | <0.1 | <0.1 | 4.7 | | | | | | | | |
| 57-12-5 | Cyanide, Free | (4) | 10 | √ | See Total Cyanide | See Total Cyanide | See Total Cyanide | | | | | | | | |
| 94-75-7 | 2,4 Dichlorophenoxy acetic acid (synonym = 2,4-D) | (4) | (5) | √ (PWS) | <0.01 | <0.01 | | | | | | | | | |
| 1746-01-6 | Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq) | 1613 | 0.00001 | √ (Paper Mills & Oil Refineries) | | | | | | | | | | | |
| N/A | *E. coli* / *Enterococcus* (N/CML) | (4) | (5) | √ | 75 / >2420 | 22 / 9 | | | | | | | | | |
| N/A | Foaming Agents (as MBAS) | (4) | (5) | √ (PWS) | | | | | | | | | | | |
| 6/4/7783 | Hydrogen Sulfide | (5) | (5) | √ | <0.05 | <0.05 | | | | | | | | | |
| 14797-55-8 | Nitrate as N (mg/L) | (4) | (5) | √ (PWS) | 0.04 | <0.01 | 77.55 | | | 10 | | | | | |
| 14808-79-8 | Sulfate (mg/L) | (4) | (5) | √ (PWS) | 639.17 | 2.62 | 32.45 | | | 250 | | | | 250 | |
| N/A | Total Dissolved Solids (mg/L) | (4) | (5) | √ (PWS) | 8036.2 | 40 | | -- | -- | 500 | -- | -- | -- | 500 | -- |
| 60-10-5 | Tributyltin | NBSR 85-3-295 | (5) | √ | <30 | <30 | | | | | | | | | |
| 93-72-1 | 2-(2,4,5-Trichlorophenoxy) propionic acid (synonym = Silvex) | (4) | (5) | √ | <0.002 | <0.002 | | | | | | | | | |
| | Hardness (mg/L as $CaCO_3$) | (4) | (5) | √ | 1470.6 | <3 | | | | | | | | | |
| OTHER POLLUTANTS | | | | | | | | | | | | | | | |
| | Total Kjeldahl Nitrogen | -- | -- | | | | | | | | | | | | |
| | Total Organic Nitrogen | -- | -- | | 0.41 | <0.3 | 1.7 | | | | | | | | |
| | Total Phosphorus | -- | -- | | <0.05 | <0.05 | 14.5 | | | | | | | | |
| 24959-67-9 | Bromide | -- | -- | | <0.05 | <0.1 | <0.1 | | | | | | | | |
| | Color | -- | -- | | 16.5 NTU | 22 NTU | 15 NTU | | | | | | | | |
| | Fluoride | -- | -- | | 0.359 | 0.025 | 2.699 | | | | | | | | |
| | Sulfide | -- | -- | | <0.05 | 0.08 | <0.05 | | | | | | | | |
| | Sulfite | -- | -- | | | | | | | | | | | | |
| | Surfactants | -- | -- | | <0.01 | <0.01 | 0.023 | | | | | | | | |
| 542-88-1 | Bis (Chloromethyl) Ether | -- | -- | | | | | | | | | | | | |
| | Fecal coliform | -- | -- | | | | 10 N/100 mL | | | | | | | | |

Surry Power Station and Gravel Neck - VA0004090
Effluent Data Required by Form 2C - 2012 Permit Reissuance

Note: These data represent the maximum reported values. Please see application for calculated values.

| Pollutant | | Outfall Number | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 001 | 002 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 |
| Biochemical Oxygen Demand (mg/L) | | <3.0 | <3.0 | 22 | | | | | | | | | | | | | | | | | | | | | |
| Chemical Oxygen Demand (mg/L) | | 13.94 | 24.61 | | | | | | | | | | | | | | | | | | | | | | |
| Total Organic Carbon (mg/L) | | 4.7 | 8.6 | | | | | | | | 21.1 | | | | | | | | | | | | | | |
| Total Suspended Solids (mg/L) | | 40.2 | 28.1 | 7.4 | | | 1 | 5.4 | | <1 | 18.5 | <1 | 4.7 | 6.5 | 6.2 | 10.9 | <1 | <1 | | | 1.4 | <1 | 9 | 2.1 | 1.8 |
| Flow (MGD) | | 2304 | 0.01309 | 0.13954 | 0.0078 | 0.0195 | 0.0216 | 0.01473 | 0.0156 | 0.0031 | 0.02817 | 0.0181 | 0.02787 | 0.02787 | 0.02787 | 0.02787 | 0.0429 | 0.0429 | 0.023 | 2.982 | 0.09 | 0.09 | 0.038 | 0.0005 | 0.1025 |
| Temperature | Winter (°C) | 13.3 | 12.8 | | | | | | | | | | | | | | | | | | | | | | |
| | Summer (°C) | 30.2 | 27.2 | | | | | | | | | | | | | | | | | | | | | | |
| pH | Min. | 6.9 | 5.1 | 6.25 | 6.32 | 7.44 | 8.26 | 7.55 | 6.16 | 8.02 | 6.8 | 6.36 | 7.8 | 5.9 | 5.94 | 6.86 | 9.41 | 9.75 | 7.87 | 7.6 | 7.18 | 9.37 | 4.9 | 6.35 | 8.74 |
| | Max. | 8.5 | 6.75 | 8.15 | 8.85 | 8.33 | 8.39 | 9.68 | 7.07 | 9.92 | 9.06 | 7.09 | 9.35 | 9.42 | 9.46 | 9.76 | 9.93 | 9.75 | 7.87 | 7.6 | 9.35 | 9.45 | 8.65 | 6.35 | 8.74 |
| Oil & Grease HEM | | <5 | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5.9 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |

VA0004090 - Surry Power Station and Gravel Neck
DMR Data March 2007-February 2012

Outfall 001

| Total Residual Chlorine (mg/L) | | |
|---|---|---|
| DMR Due | mo | we |
| 10-Mar-07 | <QL | <QL |
| 10-Apr-07 | <QL | <QL |
| 10-May-07 | <QL | <QL |
| 10-Jun-07 | <QL | <QL |
| 10-Jul-07 | <QL | <QL |
| 10-Aug-07 | <QL | <QL |
| 10-Sep-07 | <QL | <QL |
| 10-Oct-07 | <QL | <QL |
| 10-Nov-07 | <QL | <QL |
| 10-Dec-07 | <QL | <QL |
| 10-Jan-08 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Mar-08 | <QL | <QL |
| 10-Apr-08 | <QL | <QL |
| 10-May-08 | <QL | <QL |
| 10-Jun-08 | <QL | <QL |
| 10-Jul-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Sep-08 | <QL | <QL |
| 10-Oct-08 | <QL | <QL |
| 10-Nov-08 | <QL | <QL |
| 10-Dec-08 | <QL | <QL |
| 10-Jan-09 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Mar-09 | <QL | <QL |
| 10-Apr-09 | <QL | <QL |
| 10-May-09 | <QL | <QL |
| 10-Jun-09 | <QL | <QL |
| 10-Jul-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Sep-09 | <QL | <QL |
| 10-Oct-09 | <QL | <QL |
| 10-Nov-09 | <QL | <QL |
| 10-Dec-09 | <QL | <QL |
| 10-Jan-10 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Mar-10 | <QL | <QL |
| 10-Apr-10 | <QL | <QL |
| 10-May-10 | <QL | <QL |
| 10-Jun-10 | <QL | <QL |
| 10-Jul-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Sep-10 | <QL | <QL |
| 10-Oct-10 | <QL | <QL |
| 10-Nov-10 | <QL | <QL |
| 10-Dec-10 | <QL | <QL |
| 10-Jan-11 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Mar-11 | <QL | <QL |
| 10-Apr-11 | <QL | <QL |
| 10-May-11 | <QL | <QL |
| 10-Jun-11 | <QL | <QL |
| 10-Jul-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| 10-Oct-11 | <QL | <QL |
| 10-Nov-11 | <QL | <QL |
| 10-Dec-11 | <QL | <QL |
| 10-Jan-12 | <QL | <QL |
| 10-Feb-12 | <QL | <QL |

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Mar-07 | 1987.255 | 2027.4 |
| 10-Apr-07 | 1729.169 | 1841.52 |
| 10-May-07 | 1760.048 | 2016 |
| 10-Jun-07 | 1955.434 | 2021.159 |
| 10-Jul-07 | 2276.812 | 2304 |
| 10-Aug-07 | 2274.096 | 2274.096 |
| 10-Sep-07 | 2268.679 | 2304 |
| 10-Oct-07 | 2069.744 | 2304 |
| 10-Nov-07 | 1760.651 | 2016 |
| 10-Dec-07 | 1127.844 | 1636.32 |
| 10-Jan-08 | 1939.072 | 2016 |
| 10-Feb-08 | 1813.904 | 2016 |
| 10-Mar-08 | 1724.126 | 1728 |
| 10-Apr-08 | 1845.054 | 2019.6 |
| 10-May-08 | 2151.568 | 2304 |
| 10-Jun-08 | 1648.35 | 2304 |
| 10-Jul-08 | 2259.843 | 2304 |
| 10-Aug-08 | 2300.396 | 2304 |
| 10-Sep-08 | 2231.318 | 2304 |
| 10-Oct-08 | 2060.66 | 2304 |
| 10-Nov-08 | 1821.24 | 2016 |
| 10-Dec-08 | 1875.367 | 2052 |
| 10-Jan-09 | 1929.274 | 2016 |
| 10-Feb-09 | 1921.95 | 2016 |
| 10-Mar-09 | 2002.174 | 2016 |
| 10-Apr-09 | 1788.2 | 2016 |
| 10-May-09 | 1729.1 | 2016 |
| 10-Jun-09 | 1890.278 | 2304 |
| 10-Jul-09 | 2276.136 | 2304 |
| 10-Aug-09 | 2288.44 | 2304 |
| 10-Sep-09 | 2249.8 | 2304 |
| 10-Oct-09 | 2159.4 | 2304 |
| 10-Nov-09 | 1933.8 | 2304 |
| 10-Dec-09 | 1306.1 | 1306.1 |
| 10-Jan-10 | 1980 | 2133.84 |
| 10-Feb-10 | 1880.4 | 2040.96 |
| 10-Mar-10 | 1944.2 | 2066.04 |
| 10-Apr-10 | 1952.234 | 2270.16 |
| 10-May-10 | 1403.52 | 2304 |
| 10-Jun-10 | 2067.027 | 2304 |
| 10-Jul-10 | 1991.8 | 1991.8 |
| 10-Aug-10 | 2116.8 | 2304 |
| 10-Sep-10 | 2193.19 | 2304 |
| 10-Oct-10 | 2019.6 | 2304 |
| 10-Nov-10 | 1737.4 | 2016 |
| 10-Dec-10 | 950.7 | 1271.4 |
| 10-Jan-11 | 1931.2 | 2016 |
| 10-Feb-11 | 1899.8 | 2016 |
| 10-Mar-11 | 1822.6 | 2016 |
| 10-Apr-11 | 2006.2 | 2286.1 |
| 10-May-11 | 1400.9 | 2146.2 |
| 10-Jun-11 | 1266.8 | 2016 |
| 10-Jul-11 | 2273.8 | 2304 |
| 10-Aug-11 | 2273.4 | 2304 |
| 10-Sep-11 | 2283.4 | 2304 |
| 10-Oct-11 | 2104.5 | 2304 |
| 10-Nov-11 | 1998.1 | 2304 |
| 10-Dec-11 | 2015.4 | 2148.5 |
| 10-Jan-12 | 2013.8 | 2020.1 |
| 10-Feb-12 | 1888.2 | 2016 |
| Maximum: | 2300.396 | |

| Heat Rejected (BTU/hr) | |
|---|---|
| DMR Due | Max |
| 10-Mar-07 | 11.854 |
| 10-Apr-07 | 11.872 |
| 10-May-07 | 11.873 |
| 10-Jun-07 | 11.966 |
| 10-Jul-07 | 11.9 |
| 10-Aug-07 | 11.963 |
| 10-Sep-07 | 11.9 |
| 10-Oct-07 | 11.959 |
| 10-Nov-07 | 11.925 |
| 10-Dec-07 | 6.029 |
| 10-Jan-08 | 11.9 |
| 10-Feb-08 | 11.86 |
| 10-Mar-08 | 11.84 |
| 10-Apr-08 | |
| 10-May-08 | 11.87 |
| 10-Jun-08 | 11.93 |
| 10-Jul-08 | 11.9 |
| 10-Aug-08 | 12 |
| 10-Sep-08 | 12 |
| 10-Oct-08 | 12 |
| 10-Nov-08 | 11.9 |
| 10-Apr-07 | 11.9 |
| 10-Jan-09 | 11.9 |
| 10-Feb-09 | 11.9 |
| 10-Mar-09 | 11.9 |
| 10-Nov-08 | 11.9 |
| 10-May-09 | |
| 10-Jun-09 | 11.9 |
| 10-Jul-09 | 12 |
| 10-Aug-09 | 12 |
| 10-Sep-09 | 12.1 |
| 10-Oct-09 | 12 |
| 10-Nov-09 | 11.9 |
| 10-Dec-09 | 7.9 |
| 10-Jan-10 | 11.9 |
| 10-Feb-10 | 11.9 |
| 10-Mar-10 | |
| 10-Apr-10 | 11.9 |
| 10-May-10 | 11.9 |
| 10-Jun-10 | 12 |
| 10-Jul-10 | 12.1 |
| 10-Aug-10 | 12.1 |
| 10-Sep-10 | 12.2 |
| 10-Oct-10 | 12 |
| 10-Nov-10 | 12 |
| 10-Dec-10 | 6 |
| 10-Jan-11 | 11.8 |
| 10-Feb-11 | 11.8 |
| 10-Mar-11 | |
| 10-Apr-11 | 11.9 |
| 10-May-11 | 11.9 |
| 10-Jun-11 | 6.1 |
| 10-Jul-11 | 12 |
| 10-Aug-11 | 12.1 |
| 10-Sep-11 | 12 |
| 10-Oct-11 | 12 |
| 10-Nov-11 | 11.9 |
| 10-Dec-11 | 11.8 |
| 10-Jan-12 | 11.8 |
| 10-Feb-12 | 11.8 |

| pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Mar-07 | 7.82 | 7.72 |
| 10-Apr-07 | 7.51 | 7.48 |
| 10-May-07 | 7.46 | 7.42 |
| 10-Jun-07 | 7.37 | 7.13 |
| 10-Jul-07 | 7.53 | 7.41 |
| 10-Aug-07 | 7.55 | 7.28 |
| 10-Sep-07 | 7.53 | 7.5 |
| 10-Oct-07 | 7.45 | 7.4 |
| 10-Nov-07 | 7.56 | 7.5 |
| 10-Dec-07 | 7.1 | 7.09 |
| 10-Jan-08 | 7.88 | 7.84 |
| 10-Feb-08 | 7.77 | 7.42 |
| 10-Mar-08 | 7.18 | 7.06 |
| 10-Apr-08 | 7.84 | 7.6 |
| 10-May-08 | 7.65 | 7.6 |
| 10-Jun-08 | 7.56 | 7.51 |
| 10-Jul-08 | 7.52 | 7.49 |
| 10-Aug-08 | 7.59 | 7.53 |
| 10-Sep-08 | 7.71 | 7.62 |
| 10-Oct-08 | 7.23 | 7.15 |
| 10-Nov-08 | 7.59 | 7.55 |
| 10-Dec-08 | 7.88 | 7.6 |
| 10-Jan-09 | 7.66 | 7.58 |
| 10-Feb-09 | 7.8 | 7.71 |
| 10-Mar-09 | 8.19 | 8.09 |
| 10-Apr-09 | 8.5 | 8.41 |
| 10-May-09 | 7.81 | 7.59 |
| 10-Jun-09 | 7.72 | 7.69 |
| 10-Jul-09 | 7.59 | 7.5 |
| 10-Aug-09 | 7.67 | 7.56 |
| 10-Sep-09 | 7.6 | 7.22 |
| 10-Oct-09 | 7.77 | 7.5 |
| 10-Nov-09 | 7.62 | 7.57 |
| 10-Dec-09 | 7.68 | 7.66 |
| 10-Jan-10 | 7.11 | 6.9 |
| 10-Feb-10 | 7.6 | 7.59 |
| 10-Mar-10 | 7.16 | 7.07 |
| 10-Apr-10 | 7.38 | 7.35 |
| 10-May-10 | 7.43 | 7.39 |
| 10-Jun-10 | 7.48 | 7.43 |
| 10-Jul-10 | 7.47 | 7.34 |
| 10-Aug-10 | 7.39 | 7.32 |
| 10-Sep-10 | 7.6 | 7.57 |
| 10-Oct-10 | 7.67 | 7.47 |
| 10-Nov-10 | 7.63 | 7.49 |
| 10-Dec-10 | 7.74 | 7.64 |
| 10-Jan-11 | 7.91 | 7.87 |
| 10-Feb-11 | 7.84 | 7.71 |
| 10-Mar-11 | 8.11 | 8.05 |
| 10-Apr-11 | 7.77 | 7.76 |
| 10-May-11 | 7.63 | 7.55 |
| 10-Jun-11 | 7.36 | 7.28 |
| 10-Jul-11 | 7.36 | 7.23 |
| 10-Aug-11 | 7.42 | 7.38 |
| 10-Sep-11 | 7.29 | 7.17 |
| 10-Oct-11 | 7.41 | 7.26 |
| 10-Nov-11 | 7.36 | 7.33 |
| 10-Dec-11 | 7.48 | 7.45 |
| 10-Jan-12 | 7.52 | 7.48 |
| 10-Feb-12 | 7.51 | 7.24 |
| 90%tile | 7.844 | |
| 10%tile | 7.353 | |
| Max | 8.5 | |
| Min | | 7.1 |

| Intake pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Mar-07 | 7.75 | 7.6 |
| 10-Apr-07 | 7.68 | 7.65 |
| 10-May-07 | 7.53 | 7.52 |
| 10-Jun-07 | 7.54 | 7.5 |
| 10-Jul-07 | 7.41 | 7.37 |
| 10-Aug-07 | 7.48 | 7.41 |
| 10-Sep-07 | 7.51 | 7.46 |
| 10-Oct-07 | 7.37 | 7.35 |
| 10-Nov-07 | 7.49 | 7.48 |
| 10-Dec-07 | 7.15 | 7.12 |
| 10-Jan-08 | 7.8 | 7.79 |
| 10-Feb-08 | 7.82 | 7.55 |
| 10-Mar-08 | 7.15 | 7.12 |
| 10-Apr-08 | 7.57 | 7.57 |
| 10-May-08 | 7.67 | 7.59 |
| 10-Jun-08 | 7.63 | 7.59 |
| 10-Jul-08 | 7.56 | 7.47 |
| 10-Aug-08 | 7.67 | 7.6 |
| 10-Sep-08 | 7.82 | 7.68 |
| 10-Oct-08 | 7.21 | 7.2 |
| 10-Nov-08 | 7.63 | 7.6 |
| 10-Dec-08 | 7.98 | 7.68 |
| 10-Jan-09 | 7.66 | 7.6 |
| 10-Feb-09 | 7.76 | 7.75 |
| 10-Mar-09 | 8.15 | 8.01 |
| 10-Apr-09 | 8.46 | 8.41 |
| 10-May-09 | 7.89 | 7.66 |
| 10-Jun-09 | 7.74 | 7.64 |
| 10-Jul-09 | 7.62 | 7.52 |
| 10-Aug-09 | 7.84 | 7.72 |
| 10-Sep-09 | 7.78 | 7.7 |
| 10-Oct-09 | 7.73 | 7.68 |
| 10-Nov-09 | 7.72 | 7.69 |
| 10-Dec-09 | 7.8 | 7.79 |
| 10-Jan-10 | 6.87 | 6.84 |
| 10-Feb-10 | 7.77 | 7.75 |
| 10-Mar-10 | 7.36 | 6.43 |
| 10-Apr-10 | 7.53 | 7.39 |
| 10-May-10 | 7.57 | 7.55 |
| 10-Jun-10 | 7.51 | 7.48 |
| 10-Jul-10 | 7.54 | 7.46 |
| 10-Aug-10 | 7.44 | 7.4 |
| 10-Sep-10 | 7.48 | 7.45 |
| 10-Oct-10 | 7.62 | 7.57 |
| 10-Nov-10 | 7.69 | 7.58 |
| 10-Dec-10 | 7.8 | 7.77 |
| 10-Jan-11 | 7.99 | 7.97 |
| 10-Feb-11 | 8.11 | 8.08 |
| 10-Mar-11 | 8.15 | 8.09 |
| 10-Apr-11 | 7.86 | 7.83 |
| 10-May-11 | 7.71 | 7.68 |
| 10-Jun-11 | 7.55 | 7.44 |
| 10-Jul-11 | 7.72 | 7.41 |
| 10-Aug-11 | 7.41 | 7.31 |
| 10-Sep-11 | 7.34 | 7.29 |
| 10-Oct-11 | 7.47 | 7.43 |
| 10-Nov-11 | 7.5 | 7.48 |
| 10-Dec-11 | 7.6 | 7.55 |
| 10-Jan-12 | 7.66 | 7.57 |
| 10-Feb-12 | 7.63 | 7.55 |
| 90%tile | 7.899 | |
| 10%tile | 7.369 | |
| Max | 8.46 | |
| Min | | 6.87 |

| Intake TSS (mg/L) | | |
|---|---|---|
| DMR Due | Min | Max |
| 10-Aug-07 | 88 | 88 |
| 10-Feb-08 | 55 | 55 |
| 10-Aug-08 | 62 | 62 |
| 10-Feb-09 | 63.9 | 63.9 |
| 10-Aug-09 | 47 | 47 |
| 10-Feb-10 | 48.8 | 48.8 |
| 10-Aug-10 | 125.7 | 125.7 |
| 10-Nov-10 | 238.4 | 238.4 |
| 10-Feb-11 | 43.3 | 43.3 |
| 10-Aug-11 | 17.3 | 17.3 |
| 10-Sep-11 | 289.4 | 289.4 |

| TP (mg/L) | | |
|---|---|---|
| DMR Due | Mo | Max |
| 10-Mar-07 | NR | NR |
| 10-Apr-07 | <QL | <QL |
| 10-May-07 | | |
| 10-Jun-07 | X | X |
| 10-Jul-07 | NR | NR |
| 10-Aug-07 | NR | NR |
| 10-Sep-07 | NR | NR |
| 10-Oct-07 | NR | NR |
| 10-Nov-07 | NR | NR |
| 10-Feb-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Mar-11 | <QL | <QL |

VA0004090 - Surry Power Station and Gravel Neck
DMR Data March 2007-February 2012

## Outfall 101

| BOD5 (mg/L) | | |
|---|---|---|
| DMR Due | Mo | Max |
| 10-Mar-07 | <QL | <QL |
| 10-Apr-07 | <QL | <QL |
| 10-May-07 | <QL | <QL |
| 10-Jun-07 | <QL | <QL |
| 10-Jul-07 | <QL | <QL |
| 10-Aug-07 | 1.6 | 6.45 |
| 10-Sep-07 | 1 | 5 |
| 10-Oct-07 | 1.25 | 5 |
| 10-Nov-07 | <QL | <QL |
| 10-Dec-07 | 2.7 | 7 |
| 10-Jan-08 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Mar-08 | 2.9 | 12 |
| 10-Apr-08 | 2 | 6 |
| 10-May-08 | 1 | 5 |
| 10-Jun-08 | <QL | <QL |
| 10-Jul-08 | <QL | <QL |
| 10-Aug-08 | 2 | 11 |
| 10-Sep-08 | 5 | 14 |
| 10-Oct-08 | <QL | <QL |
| 10-Nov-08 | 4 | 11 |
| 10-Dec-08 | 1.4 | 5.4 |
| 10-Jan-09 | 2.2 | 2.2 |
| 10-Feb-09 | 3 | 12 |
| 10-Mar-09 | 1.8 | 7 |
| 10-Apr-09 | 1.5 | 6 |
| 10-May-09 | 17 | 22 |
| 10-Jun-09 | 5.8 | 18 |
| 10-Jul-09 | <QL | <QL |
| 10-Aug-09 | 4 | 10 |
| 10-Sep-09 | <QL | <QL |
| 10-Oct-09 | 3 | 12 |
| 10-Nov-09 | 1.2 | 6 |
| 10-Dec-09 | <QL | <QL |
| 10-Jan-10 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Mar-10 | <QL | <QL |
| 10-Apr-10 | <QL | <QL |
| 10-May-10 | <QL | <QL |
| 10-Jun-10 | <QL | <QL |
| 10-Jul-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Sep-10 | <QL | <QL |
| 10-Oct-10 | <QL | <QL |
| 10-Nov-10 | <QL | <QL |
| 10-Dec-10 | 5.8 | 12 |
| 10-Jan-11 | <QL | <QL |
| 10-Feb-11 | 2.5 | 5 |
| 10-Mar-11 | 3.3 | 7 |
| 10-Apr-11 | <QL | <QL |
| 10-May-11 | 1.5 | 6 |
| 10-Jun-11 | 4 | 11 |
| 10-Jul-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| 10-Oct-11 | 1 | 5 |
| 10-Nov-11 | <QL | <QL |
| 10-Dec-11 | <QL | <QL |
| 10-Jan-12 | <QL | <QL |
| 10-Feb-12 | <QL | <QL |
| Average | 3.171153846 | |
| 2007 Limit | 30 | |
| % Ratio | 11% | |
| Baseline | 1/Week | |
| Reduction | 1/ 2 Months | |

| TRC (mg/L) | |
|---|---|
| DMR Due | Max |
| 10-Mar-07 | 1.9 |
| 10-Apr-07 | 1.6 |
| 10-May-07 | 1.7 |
| 10-Jun-07 | 1.6 |
| 10-Jul-07 | 1.5 |
| 10-Aug-07 | 1.3 |
| 10-Sep-07 | 1.2 |
| 10-Oct-07 | 1.6 |
| 10-Nov-07 | 1.8 |
| 10-Dec-07 | 1.2 |
| 10-Jan-08 | 1.6 |
| 10-Feb-08 | 1.7 |
| 10-Mar-08 | 1.7 |
| 10-Apr-08 | 1.3 |
| 10-May-08 | 1.6 |
| 10-Jun-08 | 1.6 |
| 10-Jul-08 | 1.5 |
| 10-Aug-08 | 1.6 |
| 10-Sep-08 | 1.6 |
| 10-Oct-08 | 1.5 |
| 10-Nov-08 | 1.6 |
| 10-Dec-08 | 1.6 |
| 10-Jan-09 | 1.6 |
| 10-Feb-09 | 1.7 |
| 10-Mar-09 | 1.6 |
| 10-Apr-09 | 2 |
| 10-May-09 | 1.9 |
| 10-Jun-09 | 1.5 |
| 10-Jul-09 | 1.6 |
| 10-Aug-09 | 1.8 |
| 10-Sep-09 | 1.5 |
| 10-Oct-09 | 1.6 |
| 10-Nov-09 | 1.7 |
| 10-Dec-09 | 1.5 |
| 10-Jan-10 | 1.6 |
| 10-Feb-10 | 1.6 |
| 10-Mar-10 | 1.9 |
| 10-Apr-10 | 1.6 |
| 10-May-10 | 1.6 |
| 10-Jun-10 | 1.6 |
| 10-Jul-10 | 1.5 |
| 10-Aug-10 | 1.6 |
| 10-Sep-10 | 1.6 |
| 10-Oct-10 | 1.6 |
| 10-Nov-10 | 1.6 |
| 10-Dec-10 | 1.6 |
| 10-Jan-11 | 1.6 |
| 10-Feb-11 | 1.7 |
| 10-Mar-11 | 2 |
| 10-Apr-11 | 1.5 |
| 10-May-11 | 1.8 |
| 10-Jun-11 | 1.6 |
| 10-Jul-11 | 1.6 |
| 10-Aug-11 | 1.6 |
| 10-Sep-11 | 1.2 |
| 10-Oct-11 | 1.6 |
| 10-Nov-11 | 1.6 |
| 10-Dec-11 | 1.6 |
| 10-Jan-12 | 1.8 |
| 10-Feb-12 | 1.5 |

| Fecal Coliform (N/100 mL) | |
|---|---|
| DMR Due | Mo. Geo. |
| 10-Mar-07 | <QL |
| 10-Apr-07 | <QL |
| 10-May-07 | <QL |
| 10-Jun-07 | <QL |
| 10-Jul-07 | <QL |
| 10-Aug-07 | 1.919592 |
| 10-Sep-07 | <QL |
| 10-Oct-07 | <QL |
| 10-Nov-07 | 3.3 |
| 10-Dec-07 | 3.3 |
| 10-Jan-08 | 3.7 |
| 10-Feb-08 | 2.2 |
| 10-Mar-08 | 1.9 |
| 10-Apr-08 | 5 |
| 10-May-08 | 4 |
| 10-Jun-08 | 9 |
| 10-Jul-08 | 3 |
| 10-Aug-08 | <QL |
| 10-Sep-08 | <QL |
| 10-Oct-08 | 3 |
| 10-Nov-08 | 3 |
| 10-Dec-08 | 1.9 |
| 10-Jan-09 | 2.5 |
| 10-Feb-09 | 1.9 |
| 10-Mar-09 | 1.9 |
| 10-Apr-09 | 1.9 |
| 10-May-09 | 2.3 |
| 10-Jun-09 | <QL |
| 10-Jul-09 | <QL |
| 10-Aug-09 | <QL |
| 10-Sep-09 | <QL |
| 10-Oct-09 | <QL |
| 10-Nov-09 | 1.9 |
| 10-Dec-09 | <QL |
| 10-Jan-10 | 1.9 |
| 10-Feb-10 | <QL |
| 10-Mar-10 | <QL |
| 10-Apr-10 | <QL |
| 10-May-10 | <QL |
| 10-Jun-10 | <QL |
| 10-Jul-10 | 1.9 |
| 10-Aug-10 | <QL |
| 10-Sep-10 | 1.9 |
| 10-Oct-10 | <QL |
| 10-Nov-10 | <QL |
| 10-Dec-10 | 10 |
| 10-Jan-11 | <QL |
| 10-Feb-11 | 2 |
| 10-Mar-11 | <QL |
| 10-Apr-11 | 2.5 |
| 10-May-11 | 2.7 |
| 10-Jun-11 | 34.1 |
| 10-Jul-11 | <QL |
| 10-Aug-11 | <QL |
| 10-Sep-11 | 1.9 |
| 10-Oct-11 | <QL |
| 10-Nov-11 | <QL |
| 10-Dec-11 | <QL |
| 10-Jan-12 | <QL |
| 10-Feb-12 | <QL |

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Mar-07 | 0.008195 | 0.028883 |
| 10-Apr-07 | 0.010393 | 0.036981 |
| 10-May-07 | 0.016886 | 0.080433 |
| 10-Jun-07 | 0.01601 | 0.031484 |
| 10-Jul-07 | 0.019127 | 0.037506 |
| 10-Aug-07 | 0.023013 | 0.042169 |
| 10-Sep-07 | 0.025305 | 0.041965 |
| 10-Oct-07 | 0.015452 | 0.025266 |
| 10-Nov-07 | 0.02628 | 0.069341 |
| 10-Dec-07 | 0.017564 | 0.031116 |
| 10-Jan-08 | 0.011835 | 0.042307 |
| 10-Feb-08 | 0.010505 | 0.03239 |
| 10-Mar-08 | 0.015596 | 0.053947 |
| 10-Apr-08 | 0.016673 | 0.049542 |
| 10-May-08 | 0.038238 | 0.13954 |
| 10-Jun-08 | 0.032264 | 0.077827 |
| 10-Jul-08 | 0.020174 | 0.034761 |
| 10-Aug-08 | 0.019989 | 0.032405 |
| 10-Sep-08 | 0.021753 | 0.037979 |
| 10-Oct-08 | 0.027019 | 0.070809 |
| 10-Nov-08 | 0.016188 | 0.026062 |
| 10-Dec-08 | 0.017363 | 0.066668 |
| 10-Jan-09 | 0.012265 | 0.038195 |
| 10-Feb-09 | 0.008018 | 0.02184 |
| 10-Mar-09 | 0.008357 | 0.018977 |
| 10-Apr-09 | 0.019493 | 0.038021 |
| 10-May-09 | 0.025102 | 0.044374 |
| 10-Jun-09 | 0.025917 | 0.051206 |
| 10-Jul-09 | 0.023488 | 0.036992 |
| 10-Aug-09 | 0.02389 | 0.050557 |
| 10-Sep-09 | 0.025563 | 0.05606 |
| 10-Oct-09 | 0.027859 | 0.049878 |
| 10-Nov-09 | 0.017989 | 0.030622 |
| 10-Dec-09 | 0.029685 | 0.091572 |
| 10-Jan-10 | 0.018889 | 0.049062 |
| 10-Feb-10 | 0.012487 | 0.046602 |
| 10-Mar-10 | 0.01443 | 0.055027 |
| 10-Apr-10 | 0.016088 | 0.039489 |
| 10-May-10 | 0.013481 | 0.021672 |
| 10-Jun-10 | 0.016339 | 0.043548 |
| 10-Jul-10 | 0.021695 | 0.034821 |
| 10-Aug-10 | 0.023709 | 0.039134 |
| 10-Sep-10 | 0.023788 | 0.039177 |
| 10-Oct-10 | 0.024668 | 0.132358 |
| 10-Nov-10 | 0.02439 | 0.047305 |
| 10-Dec-10 | 0.024973 | 0.037485 |
| 10-Jan-11 | 0.008787 | 0.020096 |
| 10-Feb-11 | 0.009305 | 0.020934 |
| 10-Mar-11 | 0.010842 | 0.020644 |
| 10-Apr-11 | 0.013621 | 0.028228 |
| 10-May-11 | 0.02283 | 0.044067 |
| 10-Jun-11 | 0.030087 | 0.043727 |
| 10-Jul-11 | 0.023351 | 0.039652 |
| 10-Aug-11 | 0.028419 | 0.079585 |
| 10-Sep-11 | 0.02449 | 0.087464 |
| 10-Oct-11 | 0.020207 | 0.047915 |
| 10-Nov-11 | 0.015423 | 0.038971 |
| 10-Dec-11 | 0.012613 | 0.025926 |
| 10-Jan-12 | 0.00892 | 0.017237 |
| 10-Feb-12 | 0.009531 | 0.030951 |
| Maximum | 0.038238 | |

| pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Mar-07 | 7.27 | 6.8 |
| 10-Apr-07 | 7.35 | 6.86 |
| 10-May-07 | 7.43 | 6.95 |
| 10-Jun-07 | 7.45 | 6.81 |
| 10-Jul-07 | 7.24 | 6.67 |
| 10-Aug-07 | 7.31 | 6.89 |
| 10-Sep-07 | 7.29 | 6.86 |
| 10-Oct-07 | 7.41 | 6.92 |
| 10-Nov-07 | 7.59 | 7.2 |
| 10-Dec-07 | 7.55 | 7.16 |
| 10-Jan-08 | 7.19 | 6.64 |
| 10-Feb-08 | 7.29 | 6.34 |
| 10-Mar-08 | 7.29 | 6.76 |
| 10-Apr-08 | 7.46 | 6.61 |
| 10-May-08 | 7.46 | 6.61 |
| 10-Jun-08 | 7.58 | 6.7 |
| 10-Jul-08 | 7.37 | 6.9 |
| 10-Aug-08 | 7.48 | 6.64 |
| 10-Sep-08 | 7.57 | 7.01 |
| 10-Oct-08 | 7.32 | 6.93 |
| 10-Nov-08 | 7.47 | 6.96 |
| 10-Dec-08 | 7.42 | 6.95 |
| 10-Jan-09 | 7.27 | 6.55 |
| 10-Feb-09 | 7.53 | 7.04 |
| 10-Mar-09 | 7.68 | 6.97 |
| 10-Apr-09 | 7.52 | 7.03 |
| 10-May-09 | 7.67 | 6.86 |
| 10-Jun-09 | 7.6 | 6.55 |
| 10-Jul-09 | 7.22 | 6.52 |
| 10-Aug-09 | 7.42 | 6.92 |
| 10-Sep-09 | 7.52 | 6.92 |
| 10-Oct-09 | 7.49 | 6.88 |
| 10-Nov-09 | 7.43 | 6.85 |
| 10-Dec-09 | 7.56 | 6.67 |
| 10-Jan-10 | 8.15 | 6.63 |
| 10-Feb-10 | 7.49 | 6.25 |
| 10-Mar-10 | 7.41 | 6.41 |
| 10-Apr-10 | 7.35 | 6.51 |
| 10-May-10 | 7.15 | 6.27 |
| 10-Jun-10 | 7.48 | 6.47 |
| 10-Jul-10 | 7.16 | 6.44 |
| 10-Aug-10 | 7.23 | 6.35 |
| 10-Sep-10 | 7.42 | 6.52 |
| 10-Oct-10 | 7.71 | 6.37 |
| 10-Nov-10 | 7.74 | 6.26 |
| 10-Dec-10 | 7.68 | 6.44 |
| 10-Jan-11 | 8.08 | 6.32 |
| 10-Feb-11 | 7.59 | 6.18 |
| 10-Mar-11 | 7.75 | 7.41 |
| 10-Apr-11 | 7.67 | 7.15 |
| 10-May-11 | 7.67 | 6.61 |
| 10-Jun-11 | 7.69 | 6.76 |
| 10-Jul-11 | 7.5 | 6.75 |
| 10-Aug-11 | 7.45 | 6.06 |
| 10-Sep-11 | 7.68 | 6.35 |
| 10-Oct-11 | 7.2 | 6.41 |
| 10-Nov-11 | 7.19 | 6.41 |
| 10-Dec-11 | 7.34 | 6.32 |
| 10-Jan-12 | 7.57 | 6.84 |
| 10-Feb-12 | 7.53 | 6.55 |
| Maximum | 8.15 | |
| Minimum | | 6.06 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Mar-07 | 1.2 | 1.3 |
| 10-Apr-07 | <QL | <QL |
| 10-May-07 | 1.3 | 1.3 |
| 10-Jun-07 | 1.2 | 1.2 |
| 10-Jul-07 | 3.1 | 3.1 |
| 10-Aug-07 | <QL | <QL |
| 10-Sep-07 | 2.2 | 2.2 |
| 10-Oct-07 | 1.1 | 1.1 |
| 10-Nov-07 | 2 | 2 |
| 10-Dec-07 | 5.2 | 5.2 |
| 10-Jan-08 | 1.8 | 1.8 |
| 10-Feb-08 | 7.4 | 7.4 |
| 10-Mar-08 | 2.1 | 2.1 |
| 10-Apr-08 | 1.4 | 1.4 |
| 10-May-08 | 1.2 | 1.2 |
| 10-Jun-08 | 3 | 3 |
| 10-Jul-08 | 1.7 | 1.7 |
| 10-Aug-08 | 1.1 | 1.1 |
| 10-Sep-08 | 1.1 | 1.1 |
| 10-Oct-08 | 2.2 | 2.2 |
| 10-Nov-08 | 2.7 | 2.7 |
| 10-Dec-08 | 1.9 | 1.9 |
| 10-Jan-09 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Mar-09 | 1.2 | 1.2 |
| 10-Apr-09 | 6.8 | 6.8 |
| 10-May-09 | 1.6 | 1.6 |
| 10-Jun-09 | 1.4 | 1.4 |
| 10-Jul-09 | 1.3 | 1.3 |
| 10-Aug-09 | <QL | <QL |
| 10-Sep-09 | <QL | <QL |
| 10-Oct-09 | <QL | <QL |
| 10-Nov-09 | 2.1 | 2.1 |
| 10-Dec-09 | <QL | <QL |
| 10-Jan-10 | 1.3 | 1.3 |
| 10-Feb-10 | <QL | <QL |
| 10-Mar-10 | 1.1 | 1.1 |
| 10-Apr-10 | <QL | <QL |
| 10-May-10 | <QL | <QL |
| 10-Jun-10 | <QL | <QL |
| 10-Jul-10 | 1.3 | 1.3 |
| 10-Aug-10 | <QL | <QL |
| 10-Sep-10 | <QL | <QL |
| 10-Oct-10 | <QL | <QL |
| 10-Nov-10 | 1.6 | 1.6 |
| 10-Dec-10 | 1.9 | 1.9 |
| 10-Jan-11 | 2.3 | 2.3 |
| 10-Feb-11 | <QL | <QL |
| 10-Mar-11 | 2 | 2 |
| 10-Apr-11 | 1.2 | 1.2 |
| 10-May-11 | 2.3 | 2.3 |
| 10-Jun-11 | 12.9 | 12.9 |
| 10-Jul-11 | 1.1 | 1.1 |
| 10-Aug-11 | 3.7 | 3.7 |
| 10-Sep-11 | <QL | <QL |
| 10-Oct-11 | 3.2 | 3.2 |
| 10-Nov-11 | 1.1 | 1.1 |
| 10-Dec-11 | <QL | <QL |
| 10-Jan-12 | 1.7 | 1.7 |
| 10-Feb-12 | 2 | 2 |
| Average | 2.38095238 | |
| 2007 Limit | 30 | |
| % Ratio | 8% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

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## Outfall 102

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.0234 | 0.0234 |
| 10-Feb-08 | 0.0078 | 0.0078 |
| 10-Aug-08 | 0.0078 | 0.0078 |
| 10-Feb-09 | 0.0078 | 0.0078 |
| 10-Aug-09 | 0.0078 | 0.0078 |
| 10-Feb-10 | 0.0078 | 0.0078 |
| 10-Aug-10 | 0.0078 | 0.0078 |
| 10-Feb-11 | 0.02 | 0.02 |
| 10-Aug-11 | 0.0078 | 0.0078 |
| 10-Sep-11 | 0.0117 | 0.0117 |
| Maximum | 0.0234 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Aug-07 | 8.15 | 8.15 |
| 10-Feb-08 | 7.29 | 7.29 |
| 10-Aug-08 | 7.08 | 7.08 |
| 10-Feb-09 | 7.25 | 7.25 |
| 10-Aug-09 | 6.32 | 6.32 |
| 10-Feb-10 | 8.85 | 8.85 |
| 10-Aug-10 | 7.93 | 7.93 |
| 10-Feb-11 | 8.87 | 8.87 |
| 10-Aug-11 | 8.45 | 8.45 |
| 10-Sep-11 | 7.22 | 7.22 |

| TSS Net Increase (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0 | 0 |
| 10-Feb-08 | 0 | 0 |
| 10-Aug-08 | 0 | 0 |
| 10-Feb-09 | 0 | 0 |
| 10-Aug-09 | 0 | 0 |
| 10-Feb-10 | 0 | 0 |
| 10-Aug-10 | 0 | 0 |
| 10-Feb-11 | 0 | 0 |
| 10-Aug-11 | 0 | 0 |
| 10-Sep-11 | 0 | 0 |
| Average | 0 | |
| 2007 Limit | 30.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

## Outfall 103

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.0234 | 0.0234 |
| 10-Feb-08 | 0.0156 | 0.0156 |
| 10-Aug-08 | 0.0078 | 0.0078 |
| 10-Feb-09 | 0.0078 | 0.0078 |
| 10-Aug-09 | 0.0078 | 0.0078 |
| 10-Feb-10 | 0.0078 | 0.0078 |
| 10-Aug-10 | 0.0195 | 0.0195 |
| 10-Feb-11 | 0.05 | 0.05 |
| 10-Aug-11 | 0.0078 | 0.0078 |
| 10-Sep-11 | 0.0078 | 0.0078 |
| Maximum | 0.0500 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Aug-07 | 7.81 | 7.81 |
| 10-Feb-08 | 8 | 8 |
| 10-Aug-08 | 8.14 | 8.14 |
| 10-Feb-09 | 8.08 | 8.08 |
| 10-Aug-09 | 7.44 | 7.44 |
| 10-Feb-10 | 8.33 | 8.33 |
| 10-Aug-10 | 7.68 | 7.68 |
| 10-Feb-11 | 8.77 | 8.77 |
| 10-Aug-11 | 8.48 | 8.48 |
| 10-Sep-11 | 8.25 | 8.25 |

| TSS Net Increase (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0 | 0 |
| 10-Feb-08 | 0 | 0 |
| 10-Aug-08 | 0 | 0 |
| 10-Feb-09 | 0 | 0 |
| 10-Aug-09 | 0 | 0 |
| 10-Feb-10 | 0 | 0 |
| 10-Aug-10 | 0 | 0 |
| 10-Feb-11 | 0 | 0 |
| 10-Aug-11 | 0 | 0 |
| 10-Sep-11 | 0 | 0 |
| Average | 0 | |
| 2007 Limit | 30.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

## Outfall 106

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.0234 | 0.0234 |
| 10-Feb-08 | 0.0078 | 0.0078 |
| 10-Aug-08 | 0.0156 | 0.0156 |
| 10-Feb-09 | 0.0156 | 0.0156 |
| 10-Aug-09 | 0.0078 | 0.0078 |
| 10-Feb-10 | 0.0039 | 0.0039 |
| 10-Aug-10 | 0.0156 | 0.0156 |
| 10-Feb-11 | 0.02 | 0.02 |
| 10-Aug-11 | 0.0117 | 0.0117 |
| 10-Sep-11 | 0.0078 | 0.0078 |
| Maximum | 0.0234 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Aug-07 | 6.2 | 6.2 |
| 10-Feb-08 | 6.33 | 6.33 |
| 10-Aug-08 | 6.58 | 6.58 |
| 10-Feb-09 | 6.38 | 6.38 |
| 10-Aug-09 | 6.16 | 6.16 |
| 10-Feb-10 | 6.38 | 6.38 |
| 10-Aug-10 | 7.07 | 7.07 |
| 10-Feb-11 | 6.88 | 6.88 |
| 10-Aug-11 | 6.7 | 6.7 |
| 10-Sep-11 | 6.45 | 6.45 |

| TSS Net Increase (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0 | 0 |
| 10-Feb-08 | 0 | 0 |
| 10-Aug-08 | 0 | 0 |
| 10-Feb-09 | 0 | 0 |
| 10-Aug-09 | 0 | 0 |
| 10-Feb-10 | 0 | 0 |
| 10-Aug-10 | 0 | 0 |
| 10-Feb-11 | 0 | 0 |
| 10-Aug-11 | 0 | 0 |
| 10-Sep-11 | 0 | 0 |
| Average | 0 | |
| 2007 Limit | 30.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

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## Outfall 104

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.0216 | 0.0216 |
| 10-Feb-08 | 0.0216 | 0.0216 |
| 10-Aug-08 | 0.0216 | 0.0216 |
| 10-Feb-09 | 0.0216 | 0.0216 |
| 10-Aug-09 | 0.0216 | 0.0216 |
| 10-Feb-10 | 0.0216 | 0.0216 |
| 10-Aug-10 | 0.0216 | 0.0216 |
| 10-Feb-11 | 0.0216 | 0.0216 |
| 10-Aug-11 | 0.0216 | 0.0216 |
| 10-Sep-11 | 0.0216 | 0.0216 |
| Maximum | 0.0216 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | 8.42 | 8.42 |
| 10-Feb-08 | 8.39 | 8.39 |
| 10-Aug-08 | 8.26 | 8.26 |
| 10-Feb-09 | 8.31 | 8.31 |
| 10-Aug-09 | 8.31 | 8.31 |
| 10-Feb-10 | 8.38 | 8.38 |
| 10-Aug-10 | 8.35 | 8.35 |
| 10-Feb-11 | 8.64 | 8.64 |
| 10-Aug-11 | 8.37 | 8.37 |
| 10-Sep-11 | 8.5 | 8.5 |
| Min. | 8.26 | |
| Max | | 8.64 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | 1 | 1 |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 1 | |
| 2007 Limit | 30.0 | |
| % Ratio | 3% | |
| Baseline | 1/Month | |
| Reduction | 1/6 Months | |

## Outfall 109

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.0181 | 0.0181 |
| 10-Feb-08 | 0.0181 | 1.0181 |
| 10-Aug-08 | 0.0181 | 0.0181 |
| 10-Feb-09 | 0.0181 | 0.0181 |
| 10-Aug-09 | 0.0181 | 0.0181 |
| 10-Feb-10 | 0.0181 | 0.0181 |
| 10-Aug-10 | 0.0181 | 0.0181 |
| 10-Feb-11 | 0.0181 | 0.0181 |
| 10-Aug-11 | 0.0181 | 0.0181 |
| 10-Sep-11 | 0.0181 | 0.0181 |
| Maximum | 0.0181 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Oct-09 | <5.9 | <5.9 |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | 6.7 | 6.7 |
| 10-Feb-08 | 6.5 | 6.5 |
| 10-Aug-08 | 6.87 | 6.87 |
| 10-Feb-09 | 7.09 | 7.09 |
| 10-Aug-09 | 6.43 | 6.43 |
| 10-Feb-10 | 6.37 | 6.37 |
| 10-Aug-10 | 6.36 | 6.36 |
| 10-Feb-11 | 6.5 | 6.5 |
| 10-Aug-11 | 5.97 | 5.97 |
| 10-Sep-11 | 6.51 | 6.36 |
| Min. | 5.97 | |
| Max | | 7.09 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 30.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/6 Months | |

## Outfall 110

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.02787 | 0.02787 |
| 10-Feb-08 | 0.02787 | 0.02787 |
| 10-Aug-08 | 0.02787 | 0.02787 |
| 10-Feb-09 | 0.02787 | 0.02787 |
| 10-Aug-09 | 0.02787 | 0.02787 |
| 10-Feb-10 | 0.02787 | 0.02787 |
| 10-Aug-10 | 0.02787 | 0.02787 |
| 10-Feb-11 | 0.02787 | 0.02787 |
| 10-Aug-11 | 0.02787 | 0.02787 |
| 10-Sep-11 | 0.02787 | 0.02787 |
| Maximum | 0.02787 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | 6.75 | 6.75 |
| 10-Feb-08 | 9.2 | 9.2 |
| 10-Aug-08 | 9.06 | 9.06 |
| 10-Feb-09 | 7.68 | 7.68 |
| 10-Aug-09 | 8.88 | 8.88 |
| 10-Feb-10 | 7.58 | 7.58 |
| 10-Aug-10 | 8.64 | 8.64 |
| 10-Feb-11 | 9.35 | 9.35 |
| 10-Aug-11 | 9.47 | 9.47 |
| 10-Sep-11 | 7.43 | 7.43 |
| Min. | 6.75 | |
| Max | | 9.47 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 7.3 | 7.3 |
| 10-Feb-08 | 1.7 | 1.7 |
| 10-Aug-08 | 4.7 | 4.7 |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | 1.4 | 1.4 |
| 10-Feb-11 | 2.5 | 2.5 |
| 10-Aug-11 | 3 | 3 |
| 10-Sep-11 | 3.9 | 3.9 |
| Average | 3.5 | |
| 2007 Limit | 30.0 | |
| % Ratio | 12% | |
| Baseline | 1/Month | |
| Reduction | 1/6 Months | |

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## Outfall 112

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.02787 | 0.02787 |
| 10-Feb-08 | 0.02787 | 0.02787 |
| 10-Aug-08 | 0.02787 | 0.02787 |
| 10-Feb-09 | 0.02787 | 0.02787 |
| 10-Aug-09 | 0.02787 | 0.02787 |
| 10-Feb-10 | 0.02787 | 0.02787 |
| 10-Aug-10 | 0.02787 | 0.02787 |
| 10-Feb-11 | 0.02787 | 0.02787 |
| 10-Aug-11 | 0.02787 | 0.02787 |
| 10-Sep-11 | 0.02787 | 0.02787 |
| Maximum | 0.02787 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | 4.24 | 4.24 |
| 10-Feb-08 | 7.16 | 7.16 |
| 10-Aug-08 | 7.4 | 7.4 |
| 10-Feb-09 | 8.84 | 8.84 |
| 10-Aug-09 | 6.59 | 6.59 |
| 10-Feb-10 | 5.94 | 5.94 |
| 10-Aug-10 | 9.46 | 9.46 |
| 10-Feb-11 | 7.66 | 7.66 |
| 10-Aug-11 | 7.76 | 7.76 |
| 10-Sep-11 | 9.9 | 9.9 |
| Min. | 4.24 | |
| Max | | 9.9 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | 5 | 5 |
| 10-Feb-09 | 3.4 | 3.4 |
| 10-Aug-09 | 1.4 | 1.4 |
| 10-Feb-10 | 3.7 | 3.7 |
| 10-Aug-10 | 1.6 | 1.6 |
| 10-Feb-11 | 6.2 | 6.2 |
| 10-Aug-11 | 3.3 | 3.3 |
| 10-Sep-11 | 9.7 | 9.7 |
| Average | 4.2875 | |
| 2007 Limit | 30.0 | |
| % Ratio | 14% | |
| Baseline | 1/Month | |
| Reduction | 1/6 Months | |

## Outfall 113

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.02787 | 0.02787 |
| 10-Feb-08 | 0.02787 | 0.02787 |
| 10-Aug-08 | 0.02787 | 0.02787 |
| 10-Feb-09 | 0.02787 | 0.02787 |
| 10-Aug-09 | 0.02787 | 0.02787 |
| 10-Feb-10 | 0.02787 | 0.02787 |
| 10-Aug-10 | 0.02787 | 0.02787 |
| 10-Feb-11 | 0.02787 | 0.02787 |
| 10-Aug-11 | 0.02787 | 0.02787 |
| 10-Sep-11 | 0.02787 | 0.02787 |
| Maximum | 0.02787 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | 8.12 | 8.12 |
| 10-Feb-08 | 7.33 | 7.33 |
| 10-Aug-08 | 8.86 | 8.86 |
| 10-Feb-09 | 9.72 | 9.72 |
| 10-Aug-09 | 9.76 | 9.76 |
| 10-Feb-10 | 6.86 | 6.86 |
| 10-Aug-10 | 8.19 | 8.19 |
| 10-Feb-11 | 7.48 | 7.48 |
| 10-Aug-11 | 8.81 | 8.81 |
| 10-Sep-11 | 8.31 | 8.31 |
| Min. | 6.86 | |
| Max | | 9.76 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 8.6 | 8.6 |
| 10-Feb-08 | 4.8 | 4.8 |
| 10-Aug-08 | 2.5 | 2.5 |
| 10-Feb-09 | 10.9 | 10.9 |
| 10-Aug-09 | 5.7 | 5.7 |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | 6.4 | 6.4 |
| 10-Feb-11 | 4.4 | 4.4 |
| 10-Aug-11 | 6.5 | 6.5 |
| 10-Sep-11 | 28.2 | 28.2 |
| Average | 8.66666667 | |
| 2007 Limit | 30.0 | |
| % Ratio | 29% | |
| Baseline | 1/Month | |
| Reduction | 1/3 Months | |

## Outfall 120

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.038 | 0.038 |
| 10-Feb-08 | 0.038 | 0.038 |
| 10-Aug-08 | 0.038 | 0.038 |
| 10-Feb-09 | 0.038 | 0.038 |
| 10-Aug-09 | 0.038 | 0.038 |
| 10-Feb-10 | 0.038 | 0.038 |
| 10-Aug-10 | 0.038 | 0.038 |
| 10-Feb-11 | 0.038 | 0.038 |
| 10-Aug-11 | 0.038 | 0.038 |
| 10-Sep-11 | 0.038 | 0.038 |
| Maximum | 0.038 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | 5.81 | 5.81 |
| 10-Feb-08 | 5.99 | 5.99 |
| 10-Aug-08 | 4.9 | 4.9 |
| 10-Feb-09 | 7.25 | 7.25 |
| 10-Aug-09 | 7.42 | 7.42 |
| 10-Feb-10 | 7.18 | 7.18 |
| 10-Aug-10 | 7.46 | 7.46 |
| 10-Feb-11 | 8.65 | 8.65 |
| 10-Aug-11 | 6.42 | 6.42 |
| 10-Sep-11 | 6.98 | 6.98 |
| Min. | 4.9 | |
| Max | | 8.65 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | 9 | 9 |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | 4.6 | 4.6 |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | 1.6 | 1.6 |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | 1.4 | 1.4 |
| 10-Sep-11 | 14.6 | 14.6 |
| Average | 6.24 | |
| 2007 Limit | 30.0 | |
| % Ratio | 21% | |
| Baseline | 1/Month | |
| Reduction | 1/6 Months | |

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## Outfall 107

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | 0.0031 | 0.0031 |
| 10-Aug-09 | | |
| 10-Feb-10 | 0.0031 | 0.0031 |
| 10-Aug-10 | | |
| 10-Feb-11 | 0.0031 | 0.0031 |
| 10-Aug-11 | 0.0031 | 0.0031 |
| 10-Sep-11 | | |
| 10-Jan-12 | 0.0031 | 0.0031 |
| Maximum | 0.0031 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | | |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | | |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | | |
| 10-Jan-12 | <QL | <QL |

| pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | 8.02 | 8.02 |
| 10-Aug-09 | | |
| 10-Feb-10 | 9.92 | 9.92 |
| 10-Aug-10 | | |
| 10-Feb-11 | 9.13 | 9.13 |
| 10-Aug-11 | 10.32 | 10.32 |
| 10-Sep-11 | | |
| 10-Jan-12 | 7.56 | 7.56 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | | |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | | |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | | |
| 10-Jan-12 | <QL | <QL |

## Outfall 114

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | 0.0429 | 0.0429 |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | 0.0429 | 0.0429 |
| 10-Aug-11 | | |
| 10-Sep-11 | | |
| Maximum | 0.0429 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | 9.41 | 9.41 |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | 9.93 | 9.93 |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

## Outfall 115

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | 0.0429 | 0.0429 |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | 0.0429 | 0.0429 |
| 10-Sep-11 | | |
| Maximum | 0.0429 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | 9.75 | 9.75 |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | 10.42 | 10.42 |
| 10-Sep-11 | | |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | | |

Note: Blank cells means no data were reported.

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## Outfall 118

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | 0.09 | 0.09 |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | 0.09 | 0.09 |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | 0.09 | 0.09 |
| 10-Aug-11 | | |
| 10-Sep-11 | | |
| Maximum | 0.09 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | | |
| 10-Feb-08 | 9.35 | 9.35 |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | 7.18 | 7.18 |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | 9.22 | 9.22 |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | 1.4 | 1.4 |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

## Outfall 119

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | 0.09 | 0.09 |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | 0.09 | 0.09 |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | 0.09 | 0.09 |
| 10-Sep-11 | | |
| Maximum | 0.09 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | 9.37 | 9.37 |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | 9.45 | 9.45 |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | 9.89 | 9.89 |
| 10-Sep-11 | | |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | | |

## Outfall 121

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | 0.0005 | 0.0005 |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | | |
| 10-Sep-11 | | |
| Maximum | 0.0005 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | | |
| 10-Feb-08 | 6.35 | 6.35 |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | 2.1 | 2.1 |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | | |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

## Outfall 122

NO DATA REPORTED

Note: Blank cells means no data were reported.

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## Outfall 116

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | 0.023 | 0.023 |
| 10-Aug-11 | | |
| 10-Sep-11 | | |
| Maximum | 0.0230 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | 7.87 | 7.87 |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

| Net Increase TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | | |
| 10-Feb-08 | | |
| 10-Aug-08 | | |
| 10-Feb-09 | | |
| 10-Aug-09 | | |
| 10-Feb-10 | | |
| 10-Aug-10 | | |
| 10-Feb-11 | 0 | 0 |
| 10-Aug-11 | | |
| 10-Sep-11 | | |

## Outfall 117

NO DATA REPORTED

## Outfall 105

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.01309 | 0.01309 |
| 10-Feb-08 | 0.01309 | 0.01309 |
| 10-Aug-08 | 0.01309 | 0.01309 |
| 10-Feb-09 | 0.01473 | 0.01473 |
| 10-Aug-09 | 0.0098 | 0.0098 |
| 10-Feb-10 | 0.00005 | 0.00005 |
| 10-Aug-10 | 0.006545 | 0.006545 |
| 10-Feb-11 | 0.02618 | 0.02618 |
| 10-Aug-11 | 0.01309 | 0.01309 |
| 10-Sep-11 | 0.058905 | 0.058905 |
| Maximum | 0.058905 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |

| TPH (mg/L) | |
|---|---|
| DMR Due | Mo |
| 10-Feb-08 | <QL |
| 10-Feb-09 | <QL |
| 10-Feb-10 | <QL |
| 10-Feb-11 | <QL |
| 10-Aug-11 | <QL |
| 10-Sep-11 | NR |

| pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Aug-07 | 8.25 | 8.25 |
| 10-Feb-08 | 8.25 | 8.25 |
| 10-Aug-08 | 8.02 | 8.02 |
| 10-Feb-09 | 9.5 | 9.5 |
| 10-Aug-09 | 7.55 | 7.55 |
| 10-Feb-10 | 9.68 | 9.68 |
| 10-Aug-10 | 9.29 | 9.29 |
| 10-Feb-11 | 7.84 | 7.84 |
| 10-Aug-11 | 8.58 | 8.58 |
| 10-Sep-11 | 7.62 | 7.62 |
| Max | 9.68 | |
| Min | | 7.55 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | 1.7 | 1.7 |
| 10-Feb-09 | 5.4 | 5.4 |
| 10-Aug-09 | 1.9 | 1.9 |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | 1.2 | 1.2 |
| 10-Feb-11 | 6.6 | 6.6 |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |

## Outfall 111

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.02787 | 0.02787 |
| 10-Feb-08 | 0.02787 | 0.02787 |
| 10-Aug-08 | 0.02787 | 0.02787 |
| 10-Feb-09 | 0.02787 | 0.02787 |
| 10-Aug-09 | 0.02787 | 0.02787 |
| 10-Feb-10 | 0.02787 | 0.02787 |
| 10-Aug-10 | 0.02787 | 0.02787 |
| 10-Feb-11 | 0.02787 | 0.02787 |
| 10-Aug-11 | 0.02787 | 0.02787 |
| 10-Sep-11 | 0.02787 | 0.02787 |
| Maximum | 0.02787 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Aug-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| Average | 0 | |
| 2007 Limit | 15.0 | |
| % Ratio | 0% | |
| Baseline | 1/Month | |
| Reduction | 1/ 6 Months | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Aug-07 | 8.59 | 8.59 |
| 10-Feb-08 | 7.09 | 7.09 |
| 10-Aug-08 | 5.9 | 5.9 |
| 10-Feb-09 | 9.02 | 9.02 |
| 10-Aug-09 | 9.28 | 9.28 |
| 10-Feb-10 | 9.42 | 9.42 |
| 10-Aug-10 | 8.31 | 8.31 |
| 10-Feb-11 | 7.18 | 7.18 |
| 10-Aug-11 | 7.04 | 7.04 |
| 10-Sep-11 | 8.37 | 8.37 |
| Min. | 5.9 | |
| Max | | 9.42 |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | 7.7 | 7.7 |
| 10-Aug-08 | 3.9 | 3.9 |
| 10-Feb-09 | 6.5 | 6.5 |
| 10-Aug-09 | <QL | <QL |
| 10-Feb-10 | 1.7 | 1.7 |
| 10-Aug-10 | 1.1 | 1.1 |
| 10-Feb-11 | 3.5 | 3.5 |
| 10-Aug-11 | 4.2 | 4.2 |
| 10-Sep-11 | 5 | 5 |
| Average | 4.2 | |
| 2007 Limit | 30.0 | |
| % Ratio | 14% | |
| Baseline | 1/Month | |
| Reduction | 1/6 Months | |

Note: Blank cells means no data were reported.

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## Outfall 108

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Mar-07 | | |
| 10-Apr-07 | 0.017818 | 0.017818 |
| 10-May-07 | | |
| 10-Jun-07 | 0.01663 | 0.01663 |
| 10-Jul-07 | | |
| 10-Aug-07 | | |
| 10-Sep-07 | | |
| 10-Oct-07 | | |
| 10-Nov-07 | | |
| 10-Dec-07 | | |
| 10-Jan-08 | | |
| 10-Feb-08 | 0.01213 | 0.01213 |
| 10-Mar-08 | 0.01246 | 0.01246 |
| 10-Apr-08 | 0.0164 | 0.0214 |
| 10-May-08 | 0.0123 | 0.0123 |
| 10-Jun-08 | | |
| 10-Jul-08 | | |
| 10-Aug-08 | | |
| 10-Sep-08 | | |
| 10-Oct-08 | | |
| 10-Nov-08 | 0.013488 | 0.013488 |
| 10-Dec-08 | 0.01073 | 0.01073 |
| 10-Jan-09 | 0.012179 | 0.012179 |
| 10-Feb-09 | | |
| 10-Mar-09 | | |
| 10-Apr-09 | 0.00746 | 0.00746 |
| 10-May-09 | 0.00171 | 0.00171 |
| 10-Jun-09 | | |
| 10-Jul-09 | | |
| 10-Aug-09 | 0.002214 | 0.002214 |
| 10-Sep-09 | 0.0265 | 0.0265 |
| 10-Oct-09 | | |
| 10-Nov-09 | 0.01843 | 0.01843 |
| 10-Dec-09 | 0.028174 | 0.028174 |
| 10-Jan-10 | 0.0264 | 0.0264 |
| 10-Feb-10 | | |
| 10-Mar-10 | 0.02275 | 0.02275 |
| 10-Apr-10 | | |
| 10-May-10 | | |
| 10-Jun-10 | | |
| 10-Jul-10 | | |
| 10-Aug-10 | | |
| 10-Sep-10 | | |
| 10-Oct-10 | | |
| 10-Nov-10 | 0.008519 | 0.008519 |
| 10-Dec-10 | | |
| 10-Jan-11 | | |
| 10-Feb-11 | | |
| 10-Mar-11 | 0.018339 | 0.018339 |
| 10-Apr-11 | | |
| 10-May-11 | | |
| 10-Jun-11 | 0.016879 | 0.016879 |
| 10-Jul-11 | | |
| 10-Aug-11 | 0.029897 | 0.029897 |
| 10-Sep-11 | 0.049318 | 0.049318 |
| 10-Oct-11 | | |
| 10-Nov-11 | 0.022888 | 0.022888 |
| 10-Dec-11 | | |
| 10-Jan-12 | | |
| 10-Feb-12 | | |
| Maximum | 0.049318 | |

| Oil & Grease (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Mar-07 | | |
| 10-Apr-07 | <QL | <QL |
| 10-May-07 | | |
| 10-Jun-07 | <QL | <QL |
| 10-Jul-07 | | |
| 10-Aug-07 | | |
| 10-Sep-07 | | |
| 10-Oct-07 | | |
| 10-Nov-07 | | |
| 10-Dec-07 | | |
| 10-Jan-08 | | |
| 10-Feb-08 | <QL | <QL |
| 10-Mar-08 | <QL | <QL |
| 10-Apr-08 | <QL | <QL |
| 10-May-08 | <QL | <QL |
| 10-Jun-08 | | |
| 10-Jul-08 | | |
| 10-Aug-08 | | |
| 10-Sep-08 | | |
| 10-Oct-08 | | |
| 10-Nov-08 | <QL | <QL |
| 10-Dec-08 | <QL | <QL |
| 10-Jan-09 | <QL | <QL |
| 10-Feb-09 | | |
| 10-Mar-09 | | |
| 10-Apr-09 | <QL | <QL |
| 10-May-09 | <QL | <QL |
| 10-Jun-09 | | |
| 10-Jul-09 | | |
| 10-Aug-09 | <QL | <QL |
| 10-Sep-09 | <QL | <QL |
| 10-Oct-09 | | |
| 10-Nov-09 | <QL | <QL |
| 10-Dec-09 | <QL | <QL |
| 10-Jan-10 | <QL | <QL |
| 10-Feb-10 | | |
| 10-Mar-10 | <QL | <QL |
| 10-Apr-10 | | |
| 10-May-10 | | |
| 10-Jun-10 | | |
| 10-Jul-10 | | |
| 10-Aug-10 | | |
| 10-Sep-10 | | |
| 10-Oct-10 | | |
| 10-Nov-10 | <QL | <QL |
| 10-Dec-10 | | |
| 10-Jan-11 | | |
| 10-Feb-11 | | |
| 10-Mar-11 | <QL | <QL |
| 10-Apr-11 | | |
| 10-May-11 | | |
| 10-Jun-11 | <QL | <QL |
| 10-Jul-11 | | |
| 10-Aug-11 | <QL | <QL |
| 10-Sep-11 | <QL | <QL |
| 10-Oct-11 | | |
| 10-Nov-11 | <QL | <QL |
| 10-Dec-11 | | |
| 10-Jan-12 | | |
| 10-Feb-12 | | |

| pH (SU) | | |
|---|---|---|
| DMR Due | min | max |
| 10-Mar-07 | | |
| 10-Apr-07 | 7.11 | 7.11 |
| 10-May-07 | | |
| 10-Jun-07 | 7.22 | 7.22 |
| 10-Jul-07 | | |
| 10-Aug-07 | | |
| 10-Sep-07 | | |
| 10-Oct-07 | | |
| 10-Nov-07 | | |
| 10-Dec-07 | | |
| 10-Jan-08 | | |
| 10-Feb-08 | 7.61 | 7.61 |
| 10-Mar-08 | 8.01 | 8.01 |
| 10-Apr-08 | 8.58 | 8.58 |
| 10-May-08 | 7.06 | 7.06 |
| 10-Jun-08 | | |
| 10-Jul-08 | | |
| 10-Aug-08 | | |
| 10-Sep-08 | | |
| 10-Oct-08 | | |
| 10-Nov-08 | 8.32 | 8.32 |
| 10-Dec-08 | 7.61 | 7.61 |
| 10-Jan-09 | 7.45 | 7.45 |
| 10-Feb-09 | | |
| 10-Mar-09 | | |
| 10-Apr-09 | 7.61 | 7.61 |
| 10-May-09 | 7.4 | 7.4 |
| 10-Jun-09 | | |
| 10-Jul-09 | | |
| 10-Aug-09 | 9.06 | 9.06 |
| 10-Sep-09 | 8.4 | 8.4 |
| 10-Oct-09 | | |
| 10-Nov-09 | 7.73 | 7.73 |
| 10-Dec-09 | 8.31 | 8.31 |
| 10-Jan-10 | 7.24 | 7.24 |
| 10-Feb-10 | | |
| 10-Mar-10 | 6.8 | 6.8 |
| 10-Apr-10 | | |
| 10-May-10 | | |
| 10-Jun-10 | | |
| 10-Jul-10 | | |
| 10-Aug-10 | | |
| 10-Sep-10 | | |
| 10-Oct-10 | | |
| 10-Nov-10 | 7.17 | 7.17 |
| 10-Dec-10 | | |
| 10-Jan-11 | | |
| 10-Feb-11 | | |
| 10-Mar-11 | 7.93 | 7.93 |
| 10-Apr-11 | | |
| 10-May-11 | | |
| 10-Jun-11 | 7.66 | 7.66 |
| 10-Jul-11 | | |
| 10-Aug-11 | 8.9 | 8.9 |
| 10-Sep-11 | 6.72 | 6.72 |
| 10-Oct-11 | | |
| 10-Nov-11 | 7.56 | 7.56 |
| 10-Dec-11 | | |
| 10-Jan-12 | | |
| 10-Feb-12 | | |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Mar-07 | | |
| 10-Apr-07 | 5.2 | 5.2 |
| 10-May-07 | | |
| 10-Jun-07 | 4.7 | 4.7 |
| 10-Jul-07 | | |
| 10-Aug-07 | | |
| 10-Sep-07 | | |
| 10-Oct-07 | | |
| 10-Nov-07 | | |
| 10-Dec-07 | | |
| 10-Jan-08 | | |
| 10-Feb-08 | 6.1 | 6.1 |
| 10-Mar-08 | 10.4 | 10.4 |
| 10-Apr-08 | 18.5 | 18.5 |
| 10-May-08 | 11.6 | 11.6 |
| 10-Jun-08 | | |
| 10-Jul-08 | | |
| 10-Aug-08 | | |
| 10-Sep-08 | | |
| 10-Oct-08 | | |
| 10-Nov-08 | 10.5 | 10.5 |
| 10-Dec-08 | 11.4 | 11.4 |
| 10-Jan-09 | 10.2 | 10.2 |
| 10-Feb-09 | | |
| 10-Mar-09 | | |
| 10-Apr-09 | 8.8 | 8.8 |
| 10-May-09 | 10 | 10 |
| 10-Jun-09 | | |
| 10-Jul-09 | | |
| 10-Aug-09 | 10.4 | 10.4 |
| 10-Sep-09 | 9.7 | 9.7 |
| 10-Oct-09 | | |
| 10-Nov-09 | 3.2 | 3.2 |
| 10-Dec-09 | 10.7 | 10.7 |
| 10-Jan-10 | 7 | 7 |
| 10-Feb-10 | | |
| 10-Mar-10 | 5.2 | 5.2 |
| 10-Apr-10 | | |
| 10-May-10 | | |
| 10-Jun-10 | | |
| 10-Jul-10 | | |
| 10-Aug-10 | | |
| 10-Sep-10 | | |
| 10-Oct-10 | | |
| 10-Nov-10 | 6.4 | 6.4 |
| 10-Dec-10 | | |
| 10-Jan-11 | | |
| 10-Feb-11 | | |
| 10-Mar-11 | 12.5 | 12.5 |
| 10-Apr-11 | | |
| 10-May-11 | | |
| 10-Jun-11 | 3.4 | 3.4 |
| 10-Jul-11 | | |
| 10-Aug-11 | 12.2 | 12.2 |
| 10-Sep-11 | 1.9 | 1.9 |
| 10-Oct-11 | | |
| 10-Nov-11 | 5.4 | 5.4 |
| 10-Dec-11 | | |
| 10-Jan-12 | | |
| 10-Feb-12 | | |

| TOC (mg/L) | |
|---|---|
| DMR Due | max |
| 10-Aug-07 | 5.2 |
| 10-Feb-08 | 21.1 |
| 10-Aug-08 | |
| 10-Feb-09 | 13.1 |
| 10-Aug-09 | 7.9 |
| 10-Feb-10 | 9.5 |
| 10-Aug-10 | 5.4 |
| 10-Feb-11 | 5 |
| 10-Aug-11 | 6.1 |
| 10-Sep-11 | 6.2 |

| TPH (mg/L) | |
|---|---|
| DMR Due | mo |
| 10-Feb-08 | <QL |
| 10-Feb-09 | <QL |
| 10-Feb-10 | <QL |
| 10-Feb-11 | <QL |

Note: Blank cells means no data were reported.

VA0004090 - Surry Power Station and Gravel Neck
DMR Data March 2007-February 2012

## Outfall 002

| Flow (MGD) | | |
|---|---|---|
| DMR Due | mo | max |
| 10-Aug-07 | 0.0001 | 0.0001 |
| 10-Feb-08 | 0.013908 | 0.013908 |
| 10-Aug-08 | 0.00002 | 0.00002 |
| 10-Feb-09 | 0.01309 | 0.01309 |
| 10-Aug-09 | 0.000005 | 0.000005 |
| 10-Feb-10 | 0.00005 | 0.00005 |
| 10-Aug-10 | 0.009818 | 0.009818 |
| 10-Feb-11 | 0.01209 | 0.01309 |
| 10-Aug-11 | 0.009818 | 0.009818 |
| 10-Sep-11 | 0.02127 | 0.02127 |
| Maximum | 0.02127 | |

| pH (SU) | | |
|---|---|---|
| DMR Due | Max | Min |
| 10-Aug-07 | 6.05 | 6.05 |
| 10-Feb-08 | 6.19 | 6.19 |
| 10-Aug-08 | 6.11 | 6.11 |
| 10-Feb-09 | 6.12 | 6.12 |
| 10-Aug-09 | 6.36 | 6.36 |
| 10-Feb-10 | 6.75 | 6.75 |
| 10-Aug-10 | 6.15 | 6.15 |
| 10-Feb-11 | 5.1 | 5.1 |
| 10-Aug-11 | 6.14 | 6.14 |
| 10-Sep-11 | 5.34 | 5.34 |
| 90%tile | 6.4 | |
| 10%tile | 5.3 | |

| TSS (mg/L) | | |
|---|---|---|
| DMR Due | Mo | Max |
| 10-Aug-07 | 21.4 | 21.4 |
| 10-Feb-08 | 5.9 | 5.9 |
| 10-Aug-08 | 28.1 | 28.1 |
| 10-Feb-09 | 26.2 | 26.2 |
| 10-Aug-09 | 7.9 | 7.9 |
| 10-Feb-10 | 7 | 7 |
| 10-Aug-10 | 2.7 | 2.7 |
| 10-Feb-11 | 7.3 | 7.3 |
| 10-Aug-11 | 5 | 5 |
| 10-Sep-11 | 5.6 | 5.6 |

| Copper, dissolved (µg/L) | | |
|---|---|---|
| DMR Due | Mo | Max |
| 10-Aug-07 | <QL | <QL |
| 10-Feb-08 | <QL | <QL |
| 10-Aug-08 | 22 | 22 |
| 10-Feb-09 | 29 | 29 |
| 10-Aug-09 | 4 | 4 |
| 10-Feb-10 | 7 | 7 |
| 10-Aug-10 | 7 | 7 |
| 10-Feb-11 | 16 | 16 |
| 10-Aug-11 | 6 | 6 |
| 10-Sep-11 | 32 | 32 |
| 10-Mar-12 | 6 | 6 |

| Zinc, dissolved (µg/L) | | |
|---|---|---|
| DMR Due | Mo | Max |
| 10-Aug-07 | 175 | 175 |
| 10-Feb-08 | 94 | 94 |
| 10-Aug-08 | 182 | 182 |
| 10-Feb-09 | 77 | 77 |
| 10-Aug-09 | 231 | 231 |
| 10-Feb-10 | 180 | 180 |
| 10-Aug-10 | 282 | 282 |
| 10-Feb-11 | 22 | 22 |
| 10-Aug-11 | 72 | 72 |
| 10-Sep-11 | 59 | 59 |
| 10-Mar-12 | 119 | 119 |

| TPH (mg/L) | | |
|---|---|---|
| DMR Due | Mo | Max |
| 10-Feb-08 | <QL | <QL |
| 10-Feb-09 | <QL | <QL |
| 10-Feb-10 | <QL | <QL |
| 10-Feb-11 | <QL | <QL |
| 10-Aug-11 | <QL | <QL |

| PCB (µg/L) | | | |
|---|---|---|---|
| PCB Arachlor | DMR Due | Mo | Max |
| PCB-1016 | 10-Feb-08 | <QL | <QL |
| PCB-1221 | 10-Feb-08 | <QL | <QL |
| PCB-1232 | 10-Feb-08 | <QL | <QL |
| PCB-1242 | 10-Feb-08 | <QL | <QL |
| PCB-1248 | 10-Feb-08 | <QL | <QL |
| PCB-1254 | 10-Feb-08 | <QL | <QL |
| PCB-1260 | 10-Feb-08 | <QL | <QL |

| TOC (SU) | |
|---|---|
| DMR Due | Max |
| 10-Aug-07 | 4.9 |
| 10-Feb-08 | 5.3 |
| 10-Aug-08 | 5.3 |
| 10-Feb-09 | 5.4 |
| 10-Aug-09 | 6.7 |
| 10-Feb-10 | 7.7 |
| 10-Aug-10 | 8.6 |
| 10-Feb-11 | 6.4 |
| 10-Aug-11 | 7.6 |
| 10-Sep-11 | 16.8 |

# Attachment H

Effluent Limitation Analysis (MSTRANTI & STATS Printouts)

# SALTWATER AND TRANSITION ZONES
# WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Surry Power Station and Gravel Neck (OF 001)   Permit No.: VA0004090   Version: OWP Guidance Memo 00-2011 (8/24/00)

Receiving Stream: James River

| Stream Information | | |
|---|---|---|
| Mean Hardness (as CaCO3) = | 225 | mg/l |
| 90th % Temperature (Annual) = | 28.9 | ($^o$ C) |
| 10th % Temperature (Annual) = | N/A | ($^o$ C) |
| 90th % Temperature (Winter) = | N/A | ($^o$ C) |
| 90th % Maximum pH = | 8.2 | |
| 10th % Maximum pH = | 7 | |
| Tier Designation (1 or 2) = | 1 | |
| Early Life Stages Present Y/N = | Y | |
| Tidal Zone = | 2 | (1 = saltwater, 2 = transition zone) |
| Mean Salinity = | 3.5 | (g/kg) |

| Mixing Information | |
|---|---|
| Design Flow (MGD) | 2300.396 |
| Acute WLA multiplier | 1.43 |
| Chronic WLA multiplier | 1.45 |
| Human health WLA multiplier | 1.52 |

| Effluent Information | | |
|---|---|---|
| Mean Hardness (as CaCO3) = | 1470.6 | mg/L |
| 90 % Temperature (Annual) = | 30.2 | ($^o$ C) |
| 90 % Temperature (Winter) = | N/A | ($^o$ C) |
| 90 % Maximum pH = | 7.8 | SU |
| 10 % Maximum pH = | 7.4 | SU |
| Heated Discharge? (Y/N) | Y | |
| Discharge Flow = | 2300.396 | MGD |

| Parameter | Background | Water Quality Criteria | | | Wasteload Allocations | | | Antidegradation Baseline | | | Antidegradation Allocations | | | **Most Limiting Allocations** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH | Acute | Chronic | HH | Acute | Chronic | HH | Acute | Chronic | HH | **Acute** | **Chronic** | **HH** |
| Acenapthene | 0 | -- | -- | 9.9E+02 | -- | -- | 1.5E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **1.5E+03** |
| Acrolein | 0 | -- | -- | 9.3E+00 | -- | -- | 1.4E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **1.4E+01** |
| Acrylonitrile[C] | 0 | -- | -- | 2.5E+00 | -- | -- | 3.8E+00 | -- | -- | -- | -- | -- | -- | **--** | **--** | **3.8E+00** |
| Aldrin [C] | 0 | 1.3E+00 | -- | 5.0E-04 | 1.9E+00 | -- | 7.6E-04 | -- | -- | -- | -- | -- | -- | **1.9E+00** | **--** | **7.6E-04** |
| Ammonia-N (mg/l) - Annual | 0 | 3.26E+00 | 4.88E-01 | -- | 4.67E+00 | 7.07E-01 | -- | -- | -- | -- | -- | -- | -- | **4.67E+00** | **7.07E-01** | **--** |
| Ammonia-N (mg/l) - Winter | 0 | #VALUE! | #VALUE! | -- | #VALUE! | #VALUE! | -- | -- | -- | -- | -- | -- | -- | **#VALUE!** | **#VALUE!** | **--** |
| Anthracene | 0 | -- | -- | 4.0E+04 | -- | -- | 6.1E+04 | -- | -- | -- | -- | -- | -- | **--** | **--** | **6.1E+04** |
| Antimony | 0 | -- | -- | 6.4E+02 | -- | -- | 9.7E+02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **9.7E+02** |
| Arsenic | 0 | 6.9E+01 | 3.6E+01 | -- | 9.9E+01 | 5.2E+01 | -- | -- | -- | -- | -- | -- | -- | **9.9E+01** | **5.2E+01** | **--** |
| Benzene [C] | 0 | -- | -- | 5.1E+02 | -- | -- | 7.8E+02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **7.8E+02** |
| Benzidine[C] | 0 | -- | -- | 2.0E-03 | -- | -- | 3.0E-03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **3.0E-03** |
| Benzo (a) anthracene [C] | 0 | -- | -- | 1.8E-01 | -- | -- | 2.7E-01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.7E-01** |
| Benzo (b) fluoranthene [C] | 0 | -- | -- | 1.8E-01 | -- | -- | 2.7E-01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.7E-01** |
| Benzo (k) fluoranthene [C] | 0 | -- | -- | 1.8E-01 | -- | -- | 2.7E-01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.7E-01** |
| Benzo (a) pyrene [C] | 0 | -- | -- | 1.8E-01 | -- | -- | 2.7E-01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.7E-01** |
| Bis2-Chloroethyl Ether[C] | 0 | -- | -- | 5.3E+00 | -- | -- | 8.1E+00 | -- | -- | -- | -- | -- | -- | **--** | **--** | **8.1E+00** |
| Bis2-Chloroisopropyl Ether | 0 | -- | -- | 6.5E+04 | -- | -- | 9.9E+04 | -- | -- | -- | -- | -- | -- | **--** | **--** | **9.9E+04** |
| Bis2-Ethylhexyl Phthalate[C] | 0 | -- | -- | 2.2E+01 | -- | -- | 3.3E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **3.3E+01** |
| Bromoform [C] | 0 | -- | -- | 1.4E+03 | -- | -- | 2.1E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.1E+03** |
| Butylbenzylphthalate | 0 | -- | -- | 1.9E+03 | -- | -- | 2.9E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.9E+03** |
| Cadmium | 0 | 1.9E+01 | 3.4E+00 | -- | 2.7E+01 | 4.9E+00 | -- | -- | -- | -- | -- | -- | -- | **2.7E+01** | **4.9E+00** | **--** |

| Parameter | Background | Water Quality Criteria | | | Wasteload Allocations | | | Antidegradation Baseline | | | Antidegradation Allocations | | | **Most Limiting Allocations** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH | Acute | Chronic | HH | Acute | Chronic | HH | Acute | Chronic | HH | **Acute** | **Chronic** | **HH** |
| Carbon Tetrachloride [C] | 0 | -- | -- | 1.6E+01 | -- | -- | 2.4E+01 | -- | -- | -- | -- | -- | -- | -- | -- | 2.4E+01 |
| Chlordane [C] | 0 | 9.0E-02 | 4.0E-03 | 8.1E-03 | 1.3E-01 | 5.8E-03 | 1.2E-02 | -- | -- | -- | -- | -- | -- | 1.3E-01 | 5.8E-03 | 1.2E-02 |
| TRC | 0 | 1.9E+01 | 1.1E+01 | -- | 2.7E+01 | 1.6E+01 | -- | -- | -- | -- | -- | -- | -- | 2.7E+01 | 1.6E+01 | -- |
| Chlorine Prod. Oxidant | 0 | 1.3E+01 | 7.5E+00 | -- | 1.9E+01 | 1.1E+01 | -- | -- | -- | -- | -- | -- | -- | 1.9E+01 | 1.1E+01 | -- |
| Chlorobenzene | 0 | -- | -- | 1.6E+03 | -- | -- | 2.4E+03 | -- | -- | -- | -- | -- | -- | -- | -- | 2.4E+03 |
| Chlorodibromomethane [C] | 0 | -- | -- | 1.3E+02 | -- | -- | 2.0E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 2.0E+02 |
| Chloroform | 0 | -- | -- | 1.1E+04 | -- | -- | 1.7E+04 | -- | -- | -- | -- | -- | -- | -- | -- | 1.7E+04 |
| 2-Chloronaphthalene | 0 | -- | -- | 1.6E+03 | -- | -- | 2.4E+03 | -- | -- | -- | -- | -- | -- | -- | -- | 2.4E+03 |
| 2-Chlorophenol | 0 | -- | -- | 1.5E+02 | -- | -- | 2.3E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 2.3E+02 |
| Chlorpyrifos | 0 | 1.1E-02 | 5.6E-03 | -- | 1.6E-02 | 8.1E-03 | -- | -- | -- | -- | -- | -- | -- | 1.6E-02 | 8.1E-03 | -- |
| Chromium III | 0 | 1.8E+03 | 2.3E+02 | -- | 2.5E+03 | 3.3E+02 | -- | -- | -- | -- | -- | -- | -- | 2.5E+03 | 3.3E+02 | -- |
| Chromium VI | 0 | 1.6E+01 | 1.1E+01 | -- | 2.3E+01 | 1.6E+01 | -- | -- | -- | -- | -- | -- | -- | 2.3E+01 | 1.6E+01 | -- |
| Chrysene [C] | 0 | -- | -- | 1.8E-02 | -- | -- | 2.7E-02 | -- | -- | -- | -- | -- | -- | -- | -- | 2.7E-02 |
| Copper | 0 | 9.3E+00 | 6.0E+00 | -- | 1.3E+01 | 8.7E+00 | -- | -- | -- | -- | -- | -- | -- | 1.3E+01 | 8.7E+00 | -- |
| Cyanide, Free | 0 | 1.0E+00 | 1.0E+00 | 1.6E+04 | 1.4E+00 | 1.5E+00 | 2.4E+04 | -- | -- | -- | -- | -- | -- | 1.4E+00 | 1.5E+00 | 2.4E+04 |
| DDD [C] | 0 | -- | -- | 3.1E-03 | -- | -- | 4.7E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 4.7E-03 |
| DDE [C] | 0 | -- | -- | 2.2E-03 | -- | -- | 3.3E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 3.3E-03 |
| DDT [C] | 0 | 1.3E-01 | 1.0E-03 | 2.2E-03 | 1.9E-01 | 1.5E-03 | 3.3E-03 | -- | -- | -- | -- | -- | -- | 1.9E-01 | 1.5E-03 | 3.3E-03 |
| Demeton | 0 | -- | 1.0E-01 | -- | -- | 1.5E-01 | -- | -- | -- | -- | -- | -- | -- | -- | 1.5E-01 | -- |
| Diazinon | 0 | 1.7E-01 | 1.7E-01 | -- | 2.4E-01 | 2.5E-01 | -- | -- | -- | -- | -- | -- | -- | 2.4E-01 | 2.5E-01 | -- |
| Dibenz(a,h)anthracene [C] | 0 | -- | -- | 1.8E-01 | -- | -- | 2.7E-01 | -- | -- | -- | -- | -- | -- | -- | -- | 2.7E-01 |
| 1,2-Dichlorobenzene | 0 | -- | -- | 1.3E+03 | -- | -- | 2.0E+03 | -- | -- | -- | -- | -- | -- | -- | -- | 2.0E+03 |
| 1,3-Dichlorobenzene | 0 | -- | -- | 9.6E+02 | -- | -- | 1.5E+03 | -- | -- | -- | -- | -- | -- | -- | -- | 1.5E+03 |
| 1,4-Dichlorobenzene | 0 | -- | -- | 1.9E+02 | -- | -- | 2.9E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 2.9E+02 |
| 3,3-Dichlorobenzidine [C] | 0 | -- | -- | 2.8E-01 | -- | -- | 4.3E-01 | -- | -- | -- | -- | -- | -- | -- | -- | 4.3E-01 |
| Dichlorobromomethane [C] | 0 | -- | -- | 1.7E+02 | -- | -- | 2.6E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 2.6E+02 |
| 1,2-Dichloroethane [C] | 0 | -- | -- | 3.7E+02 | -- | -- | 5.6E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 5.6E+02 |
| 1,1-Dichloroethylene | 0 | -- | -- | 7.1E+03 | -- | -- | 1.1E+04 | -- | -- | -- | -- | -- | -- | -- | -- | 1.1E+04 |
| 1,2-trans-dichloroethylene | 0 | -- | -- | 1.0E+04 | -- | -- | 1.5E+04 | -- | -- | -- | -- | -- | -- | -- | -- | 1.5E+04 |
| 2,4-Dichlorophenol | 0 | -- | -- | 2.9E+02 | -- | -- | 4.4E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 4.4E+02 |
| 1,2-Dichloropropane [C] | 0 | -- | -- | 1.5E+02 | -- | -- | 2.3E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 2.3E+02 |
| 1,3-Dichloropropene [C] | 0 | -- | -- | 2.1E+02 | -- | -- | 3.2E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 3.2E+02 |
| Dieldrin [C] | 0 | 7.1E-01 | 1.9E-03 | 5.4E-04 | 1.0E+00 | 2.8E-03 | 8.2E-04 | -- | -- | -- | -- | -- | -- | 1.0E+00 | 2.8E-03 | 8.2E-04 |
| Diethyl Phthalate | 0 | -- | -- | 4.4E+04 | -- | -- | 6.7E+04 | -- | -- | -- | -- | -- | -- | -- | -- | 6.7E+04 |
| 2,4-Dimethylphenol | 0 | -- | -- | 8.5E+02 | -- | -- | 1.3E+03 | -- | -- | -- | -- | -- | -- | -- | -- | 1.3E+03 |
| Dimethyl Phthalate | 0 | -- | -- | 1.1E+06 | -- | -- | 1.7E+06 | -- | -- | -- | -- | -- | -- | -- | -- | 1.7E+06 |
| Di-n-Butyl Phthalate | 0 | -- | -- | 4.5E+03 | -- | -- | 6.8E+03 | -- | -- | -- | -- | -- | -- | -- | -- | 6.8E+03 |
| 2,4 Dinitrophenol | 0 | -- | -- | 5.3E+03 | -- | -- | 8.1E+03 | -- | -- | -- | -- | -- | -- | -- | -- | 8.1E+03 |
| 2-Methyl-4,6-Dinitrophenol | 0 | -- | -- | 2.8E+02 | -- | -- | 4.3E+02 | -- | -- | -- | -- | -- | -- | -- | -- | 4.3E+02 |
| 2,4-Dinitrotoluene [C] | 0 | -- | -- | 3.4E+01 | -- | -- | 5.2E+01 | -- | -- | -- | -- | -- | -- | -- | -- | 5.2E+01 |

| Parameter | Background | Water Quality Criteria | | | Wasteload Allocations | | | Antidegradation Baseline | | | Antidegradation Allocations | | | **Most Limiting Allocations** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH | Acute | Chronic | HH | Acute | Chronic | HH | Acute | Chronic | HH | **Acute** | **Chronic** | **HH** |
| Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin | 0 | -- | -- | 5.1E-08 | -- | -- | 7.8E-08 | -- | -- | -- | -- | -- | -- | **--** | **--** | **7.8E-08** |
| 1,2-Diphenylhydrazine[C] | 0 | -- | -- | 2.0E+00 | -- | -- | 3.0E+00 | -- | -- | -- | -- | -- | -- | **--** | **--** | **3.0E+00** |
| Alpha-Endosulfan | 0 | 3.4E-02 | 8.7E-03 | 8.9E+01 | 4.9E-02 | 1.3E-02 | 1.4E+02 | -- | -- | -- | -- | -- | -- | **4.9E-02** | **1.3E-02** | **1.4E+02** |
| Beta-Endosulfan | 0 | 3.4E-02 | 8.7E-03 | 8.9E+01 | 4.9E-02 | 1.3E-02 | 1.4E+02 | -- | -- | -- | -- | -- | -- | **4.9E-02** | **1.3E-02** | **1.4E+02** |
| Alpha + Beta Endosulfan | 0 | 3.4E-02 | 8.7E-03 | -- | 4.9E-02 | 1.3E-02 | -- | -- | -- | -- | -- | -- | -- | **4.9E-02** | **1.3E-02** | **--** |
| Endosulfan Sulfate | 0 | -- | -- | 8.9E+01 | -- | -- | 1.4E+02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **1.4E+02** |
| Endrin | 0 | 3.7E-02 | 2.3E-03 | 6.0E-02 | 5.3E-02 | 3.3E-03 | 9.1E-02 | -- | -- | -- | -- | -- | -- | **5.3E-02** | **3.3E-03** | **9.1E-02** |
| Endrin Aldehyde | 0 | -- | -- | 3.0E-01 | -- | -- | 4.6E-01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **4.6E-01** |
| Ethylbenzene | 0 | -- | -- | 2.1E+03 | -- | -- | 3.2E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **3.2E+03** |
| Fluoranthene | 0 | -- | -- | 1.4E+02 | -- | -- | 2.1E+02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.1E+02** |
| Fluorene | 0 | -- | -- | 5.3E+03 | -- | -- | 8.1E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **8.1E+03** |
| Guthion | 0 | -- | 1.0E-02 | -- | -- | 1.5E-02 | -- | -- | -- | -- | -- | -- | -- | **--** | **1.5E-02** | **--** |
| Heptachlor [C] | 0 | 5.3E-02 | 3.6E-03 | 7.9E-04 | 7.6E-02 | 5.2E-03 | 1.2E-03 | -- | -- | -- | -- | -- | -- | **7.6E-02** | **5.2E-03** | **1.2E-03** |
| Heptachlor Epoxide[C] | 0 | 5.3E-02 | 3.6E-03 | 3.9E-04 | 7.6E-02 | 5.2E-03 | 5.9E-04 | -- | -- | -- | -- | -- | -- | **7.6E-02** | **5.2E-03** | **5.9E-04** |
| Hexachlorobenzene[C] | 0 | -- | -- | 2.9E-03 | -- | -- | 4.4E-03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **4.4E-03** |
| Hexachlorobutadiene[C] | 0 | -- | -- | 1.8E+02 | -- | -- | 2.7E+02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.7E+02** |
| Hexachlorocyclohexane Alpha-BHC[C] | 0 | -- | -- | 4.9E-02 | -- | -- | 7.4E-02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **7.4E-02** |
| Hexachlorocyclohexane Beta-BHC[C] | 0 | -- | -- | 1.7E-01 | -- | -- | 2.6E-01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.6E-01** |
| Hexachlorocyclohexane Gamma-BHC[C] (Lindane) | 0 | 1.6E-01 | -- | 1.8E+00 | 2.3E-01 | -- | 2.7E+00 | -- | -- | -- | -- | -- | -- | **2.3E-01** | **--** | **2.7E+00** |
| Hexachlorocyclopentadiene | 0 | -- | -- | 1.1E+03 | -- | -- | 1.7E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **1.7E+03** |
| Hexachloroethane[C] | 0 | -- | -- | 3.3E+01 | -- | -- | 5.0E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **5.0E+01** |
| Hydrogen Sulfide | 0 | -- | 2.0E+00 | -- | -- | 2.9E+00 | -- | -- | -- | -- | -- | -- | -- | **--** | **2.9E+00** | **--** |
| Indeno (1,2,3-cd) pyrene C | 0 | -- | -- | 1.8E-01 | -- | -- | 2.7E-01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.7E-01** |
| Isophorone[C] | 0 | -- | -- | 9.6E+03 | -- | -- | 1.5E+04 | -- | -- | -- | -- | -- | -- | **--** | **--** | **1.5E+04** |
| Kepone | 0 | -- | 0.0E+00 | -- | -- | 0.0E+00 | -- | -- | -- | -- | -- | -- | -- | **--** | **0.0E+00** | **--** |
| Lead | 0 | 2.4E+02 | 9.3E+00 | -- | 3.4E+02 | 1.3E+01 | -- | -- | -- | -- | -- | -- | -- | **3.4E+02** | **1.3E+01** | **--** |
| Malathion | 0 | -- | 1.0E-01 | -- | -- | 1.5E-01 | -- | -- | -- | -- | -- | -- | -- | **--** | **1.5E-01** | **--** |
| Mercury | 0 | 1.8E+00 | 9.4E-01 | -- | 2.6E+00 | 1.4E+00 | -- | -- | -- | -- | -- | -- | -- | **2.6E+00** | **1.4E+00** | **--** |
| Methyl Bromide | 0 | -- | -- | 1.5E+03 | -- | -- | 2.3E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.3E+03** |
| Methylene Chloride [C] | 0 | -- | -- | 5.9E+03 | -- | -- | 9.0E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **9.0E+03** |
| Methoxychlor | 0 | -- | 3.0E-02 | -- | -- | 4.4E-02 | -- | -- | -- | -- | -- | -- | -- | **--** | **4.4E-02** | **--** |
| Mirex | 0 | -- | 0.0E+00 | -- | -- | 0.0E+00 | -- | -- | -- | -- | -- | -- | -- | **--** | **0.0E+00** | **--** |
| Nickel | 0 | 7.4E+01 | 8.2E+00 | 4.6E+03 | 1.1E+02 | 1.2E+01 | 7.0E+03 | -- | -- | -- | -- | -- | -- | **1.1E+02** | **1.2E+01** | **7.0E+03** |
| Nitrobenzene | 0 | -- | -- | 6.9E+02 | -- | -- | 1.0E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **1.0E+03** |
| N-Nitrosodimethylamine[C] | 0 | -- | -- | 3.0E+01 | -- | -- | 4.6E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **4.6E+01** |
| N-Nitrosodiphenylamine[C] | 0 | -- | -- | 6.0E+01 | -- | -- | 9.1E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **9.1E+01** |
| N-Nitrosodi-n-propylamine[C] | 0 | -- | -- | 5.1E+00 | -- | -- | 7.8E+00 | -- | -- | -- | -- | -- | -- | **--** | **--** | **7.8E+00** |
| Nonylphenol | 0 | 7.0E+00 | 1.7E+00 | -- | 1.0E+01 | 2.5E+00 | -- | -- | -- | -- | -- | -- | -- | **1.0E+01** | **2.5E+00** | **--** |

| Parameter | Background | Water Quality Criteria | | | Wasteload Allocations | | | Antidegradation Baseline | | | Antidegradation Allocations | | | **Most Limiting Allocations** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH | Acute | Chronic | HH | Acute | Chronic | HH | Acute | Chronic | HH | **Acute** | **Chronic** | **HH** |
| Parathion | 0 | 6.5E-02 | 1.3E-02 | -- | 9.3E-02 | 1.9E-02 | -- | -- | -- | -- | -- | -- | -- | **9.3E-02** | **1.9E-02** | **--** |
| PCB Total[C] | 0 | -- | 1.4E-01 | 6.4E-04 | -- | 2.0E-01 | 9.7E-04 | -- | -- | -- | -- | -- | -- | **--** | **2.0E-01** | **9.7E-04** |
| Pentachlorophenol [C] | 0 | 1.1E+01 | 7.9E+00 | 3.0E+01 | 1.6E+01 | 1.1E+01 | 4.6E+01 | -- | -- | -- | -- | -- | -- | **1.6E+01** | **1.1E+01** | **4.6E+01** |
| Phenol | 0 | -- | -- | 8.6E+05 | -- | -- | 1.3E+06 | -- | -- | -- | -- | -- | -- | **--** | **--** | **1.3E+06** |
| Phosphorus (Elemental) | 0 | -- | 1.0E-01 | -- | -- | 1.5E-01 | -- | -- | -- | -- | -- | -- | -- | **--** | **1.5E-01** | **--** |
| Pyrene | 0 | -- | -- | 4.0E+03 | -- | -- | 6.1E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **6.1E+03** |
| Selenium | 0 | 2.0E+01 | 5.0E+00 | 4.2E+03 | 2.9E+01 | 7.3E+00 | 6.4E+03 | -- | -- | -- | -- | -- | -- | **2.9E+01** | **7.3E+00** | **6.4E+03** |
| Silver | 0 | 1.9E+00 | -- | -- | 2.7E+00 | -- | -- | -- | -- | -- | -- | -- | -- | **2.7E+00** | **--** | **--** |
| 1,1,2,2-Tetrachloroethane[C] | 0 | -- | -- | 4.0E+01 | -- | -- | 6.1E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **6.1E+01** |
| Tetrachloroethylene[C] | 0 | -- | -- | 3.3E+01 | -- | -- | 5.0E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **5.0E+01** |
| Thallium | 0 | -- | -- | 4.7E-01 | -- | -- | 7.1E-01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **7.1E-01** |
| Toluene | 0 | -- | -- | 6.0E+03 | -- | -- | 9.1E+03 | -- | -- | -- | -- | -- | -- | **--** | **--** | **9.1E+03** |
| Toxaphene [C] | 0 | 2.1E-01 | 2.0E-04 | 2.8E-03 | 3.0E-01 | 2.9E-04 | 4.3E-03 | -- | -- | -- | -- | -- | -- | **3.0E-01** | **2.9E-04** | **4.3E-03** |
| Tributyltin | 0 | 4.2E-01 | 7.4E-03 | -- | 6.0E-01 | 1.1E-02 | -- | -- | -- | -- | -- | -- | -- | **6.0E-01** | **1.1E-02** | **--** |
| 1,2,4-Trichlorobenzene | 0 | -- | -- | 7.0E+01 | -- | -- | 1.1E+02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **1.1E+02** |
| 1,1,2-Trichloroethane[C] | 0 | -- | -- | 1.6E+02 | -- | -- | 2.4E+02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **2.4E+02** |
| Trichloroethylene [C] | 0 | -- | -- | 3.0E+02 | -- | -- | 4.6E+02 | -- | -- | -- | -- | -- | -- | **--** | **--** | **4.6E+02** |
| 2,4,6-Trichlorophenol [C] | 0 | -- | -- | 2.4E+01 | -- | -- | 3.6E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **3.6E+01** |
| Vinyl Chloride[C] | 0 | -- | -- | 2.4E+01 | -- | -- | 3.6E+01 | -- | -- | -- | -- | -- | -- | **--** | **--** | **3.6E+01** |
| Zinc | 0 | 9.0E+01 | 8.1E+01 | 2.6E+04 | 1.3E+02 | 1.2E+02 | 4.0E+04 | -- | -- | -- | -- | -- | -- | **1.3E+02** | **1.2E+02** | **4.0E+04** |

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. For transition zone waters, spreadsheet prints the lesser of the freshwater and saltwater water quality criteria.
6. Regular WLA = (WQC x WLA multiplier) - (WLA multiplier - 1)(background conc.)
7. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
8. Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)

| Metal | Site Specific Target Value (SSTV) |
|---|---|
| Antimony | 9.7E+02 |
| Arsenic III | 3.1E+01 |
| Cadmium | 2.9E+00 |
| Chromium III | 2.0E+02 |
| Chromium VI | 9.2E+00 |
| Copper | 5.2E+00 |
| Lead | 8.1E+00 |
| Mercury | 8.2E-01 |
| Nickel | 7.1E+00 |
| Selenium | 4.4E+00 |
| Silver | 1.1E+00 |
| Zinc | 5.1E+01 |

Note: do not use QL's lower than the minimum QL's provided in agency guidance

8/2/2012 10:42:13 AM

Facility = Surry Power Station & Gravel Neck
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 4.67
WLAc = 0.707
Q.L. = 0.002
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = .07
Variance = .001764
C.V. = 0.6
97th percentile daily values = .170339
97th percentile 4 day average = .116465
97th percentile 30 day average= .084423
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.07

8/2/2012 8:58:23 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Arsenic, dissolved
Chronic averaging period = 4
WLAa = 99
WLAc = 52
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025
97th percentile 4 day average = 4.99137
97th percentile 30 day average= 3.61815
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3

8/2/2012 10:32:55 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Cadmium, total recoverable
Chronic averaging period = 4
WLAa = 27
WLAc = 4.9
Q.L. = 0.3
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = .6
Variance = .1296
C.V. = 0.6
97th percentile daily values = 1.46005
97th percentile 4 day average = .998274
97th percentile 30 day average= .723631
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.6

8/2/2012 10:34:30 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Chromium, total recoverable
Chronic averaging period = 4
WLAa = 23
WLAc = 16
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1

8/2/2012 8:59:30 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Chromium VI, dissolved
Chronic averaging period = 4
WLAa = 23
WLAc = 16
Q.L. = 1.6
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 5
Variance = 9
C.V. = 0.6
97th percentile daily values = 12.1670
97th percentile 4 day average = 8.31895
97th percentile 30 day average= 6.03026
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5

8/2/2012 9:00:27 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Copper, dissolved
Chronic averaging period = 4
WLAa = 13
WLAc = 8.7
Q.L. = 0.50
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 2
Variance = 1.44
C.V. = 0.6
97th percentile daily values = 4.86683
97th percentile 4 day average = 3.32758
97th percentile 30 day average= 2.41210
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

2

8/2/2012 10:37:26 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Copper, total recoverable
Chronic averaging period = 4
WLAa = 13
WLAc = 8.7
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 4
Variance = 5.76
C.V. = 0.6
97th percentile daily values = 9.73367
97th percentile 4 day average = 6.65516
97th percentile 30 day average= 4.82421
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

4

8/2/2012 9:01:16 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Lead, dissolved
Chronic averaging period = 4
WLAa = 340
WLAc = 13
Q.L. = 0.50
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1

8/2/2012 10:28:35 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Nickel, dissolved
Chronic averaging period = 4
WLAa = 110
WLAc = 12
Q.L. = 0.94
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 5
Variance = 9
C.V. = 0.6
97th percentile daily values = 12.1670
97th percentile 4 day average = 8.31895
97th percentile 30 day average= 6.03026
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5

8/2/2012 10:29:53 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Selenium, dissolved
Chronic averaging period = 4
WLAa = 29
WLAc = 7.3
Q.L. = 2.0.
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025
97th percentile 4 day average = 4.99137
97th percentile 30 day average= 3.61815
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3

8/6/2012 2:29:55 PM

Facility = Surry Power Station & Gravel Neck
Chemical = TRC (OF 001)
Chronic averaging period = 4
WLAa = 19
WLAc = 11
Q.L. = 1
# samples/mo. = 30
# samples/wk. = 7

Summary of Statistics:

# observations = 1
Expected Value = 20000
Variance = 1440000
C.V. = 0.6
97th percentile daily values = 48668.3
97th percentile 4 day average = 33275.8
97th percentile 30 day average= 24121.0
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 16.0883226245855
Average Weekly limit = 9.8252545713861
Average Monthly LImit = 7.9737131838758

The data are:

20000

8/2/2012 10:31:07 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Zinc, dissolved
Chronic averaging period = 4
WLAa = 130
WLAc = 120
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 10
Variance = 36
C.V. = 0.6
97th percentile daily values = 24.3341
97th percentile 4 day average = 16.6379
97th percentile 30 day average= 12.0605
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

10

8/2/2012 10:38:36 AM

Facility = Surry Power Station & Gravel Neck (001)
Chemical = Zinc, total recoverable
Chronic averaging period = 4
WLAa = 130
WLAc = 120
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 10
Variance = 36
C.V. = 0.6
97th percentile daily values = 24.3341
97th percentile 4 day average = 16.6379
97th percentile 30 day average= 12.0605
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

10

# FRESHWATER
# WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Surry Power Station and Gravel Neck (OF 002) Permit No.: VA0004090

Receiving Stream: Unnamed Tributary to James River Version: OWP Guidance Memo 00-2011 (8/24/00)

| Stream Information | | | Stream Flows | | | Mixing Information | | | Effluent Information | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Hardness (as CaCO3) = | 25 | mg/L | 1Q10 (Annual) = | 0 | MGD | Annual - 1Q10 Mix = | 100 | % | Mean Hardness (as CaCO3) = | 25 | mg/L |
| 90% Temperature (Annual) = | 27.2 | deg C | 7Q10 (Annual) = | 0 | MGD | - 7Q10 Mix = | 100 | % | 90% Temp (Annual) = | 27.2 | deg C |
| 10% Temperature (Annual) = | N/A | deg C | 30Q10 (Annual) = | 0 | MGD | - 30Q10 Mix = | 100 | % | 90% Temp (Wet season) = | N/A | deg C |
| 90% Temperature (Wet season) = | N/A | deg C | 1Q10 (Wet season) = | 0 | MGD | Wet Season - 1Q10 Mix = | 100 | % | 90% Maximum pH = | 6.4 | SU |
| 90% Maximum pH = | 6.4 | SU | 30Q10 (Wet season) = | 0 | MGD | - 30Q10 Mix = | 100 | % | 10% Maximum pH = | 5.3 | SU |
| 10% Maximum pH = | 5.3 | SU | 30Q5 = | 0 | MGD | | | | Heated Discharge? (Y/N) = | N | |
| Tier Designation (1 or 2) = | 1 | | Harmonic Mean = | 0 | MGD | | | | Discharge Flow = | 0.02127 | MGD |
| Public Water Supply (PWS) Y/N? = | N | | | | | | | | | | |
| Trout Present Y/N? = | N | | | | | | | | | | |
| Early Life Stages Present Y/N? = | Y | | | | | | | | | | |

| Parameter | Background | Water Quality Criteria | | | | Wasteload Allocations | | | | Antidegradation Baseline | | | | Antidegradation Allocations | | | | **Most Limiting Allocations** | | | | Lowest LTA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | **Acute** | **Chronic** | **HH (PWS)** | **HH** | |
| Acenapthene | 0 | -- | -- | na | 9.9E+02 | -- | -- | na | 9.9E+02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **9.9E+02** | -- |
| Acrolein | 0 | -- | -- | na | 9.3E+00 | -- | -- | na | 9.3E+00 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **9.3E+00** | -- |
| Acrylonitrile[C] | 0 | -- | -- | na | 2.5E+00 | -- | -- | na | 2.5E+00 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **2.5E+00** | -- |
| Aldrin [C] | 0 | 3.0E+00 | -- | na | 5.0E-04 | 3.0E+00 | -- | na | 5.0E-04 | -- | -- | -- | -- | -- | -- | -- | -- | **3.0E+00** | **--** | **na** | **5.0E-04** | 1.23E+00 |
| Ammonia-N (mg/l) (Yearly) | 0 | 5.05E+01 | 2.98E+00 | na | -- | 5.05E+01 | 2.98E+00 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **5.05E+01** | **2.98E+00** | **na** | **--** | 1.79E+00 |
| Ammonia-N (mg/l) (High Flow) | 0 | 5.05E+01 | #VALUE! | na | -- | 5.1E+01 | #VALUE! | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **5.05E+01** | **#VALUE!** | **na** | **--** | #VALUE! |
| Anthracene | 0 | -- | -- | na | 4.0E+04 | -- | -- | na | 4.0E+04 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **4.0E+04** | -- |
| Antimony | 0 | -- | -- | na | 6.4E+02 | -- | -- | na | 6.4E+02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **6.4E+02** | -- |
| Arsenic | 0 | 3.4E+02 | 1.5E+02 | na | -- | 3.4E+02 | 1.5E+02 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **3.4E+02** | **1.5E+02** | **na** | **--** | 9.02E+01 |
| Barium | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Benzene [C] | 0 | -- | -- | na | 5.1E+02 | -- | -- | na | 5.1E+02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **5.1E+02** | -- |
| Benzidine[C] | 0 | -- | -- | na | 2.0E-03 | -- | -- | na | 2.0E-03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **2.0E-03** | -- |
| Benzo (a) anthracene [C] | 0 | -- | -- | na | 1.8E-01 | -- | -- | na | 1.8E-01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.8E-01** | -- |
| Benzo (b) fluoranthene [C] | 0 | -- | -- | na | 1.8E-01 | -- | -- | na | 1.8E-01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.8E-01** | -- |
| Benzo (k) fluoranthene [C] | 0 | -- | -- | na | 1.8E-01 | -- | -- | na | 1.8E-01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.8E-01** | -- |
| Benzo (a) pyrene [C] | 0 | -- | -- | na | 1.8E-01 | -- | -- | na | 1.8E-01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.8E-01** | -- |
| Bis2-Chloroethyl Ether [C] | 0 | -- | -- | na | 5.3E+00 | -- | -- | na | 5.3E+00 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **5.3E+00** | -- |
| Bis2-Chloroisopropyl Ether | 0 | -- | -- | na | 6.5E+04 | -- | -- | na | 6.5E+04 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **6.5E+04** | -- |
| Bis 2-Ethylhexyl Phthalate [C] | 0 | -- | -- | na | 2.2E+01 | -- | -- | na | 2.2E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **2.2E+01** | -- |
| Bromoform [C] | 0 | -- | -- | na | 1.4E+03 | -- | -- | na | 1.4E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.4E+03** | -- |
| Butylbenzylphthalate | 0 | -- | -- | na | 1.9E+03 | -- | -- | na | 1.9E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.9E+03** | -- |
| Cadmium | 0 | 8.2E-01 | 3.8E-01 | na | -- | 8.2E-01 | 3.8E-01 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **8.2E-01** | **3.8E-01** | **na** | **--** | 2.30E-01 |
| Carbon Tetrachloride [C] | 0 | -- | -- | na | 1.6E+01 | -- | -- | na | 1.6E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.6E+01** | -- |
| Chlordane [C] | 0 | 2.4E+00 | 4.3E-03 | na | 8.1E-03 | 2.4E+00 | 4.3E-03 | na | 8.1E-03 | -- | -- | -- | -- | -- | -- | -- | -- | **2.4E+00** | **4.3E-03** | **na** | **8.1E-03** | 2.58E-03 |
| Chloride | 0 | 8.6E+05 | 2.3E+05 | na | -- | 8.6E+05 | 2.3E+05 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **8.6E+05** | **2.3E+05** | **na** | **--** | 1.38E+05 |
| TRC | 0 | 1.9E+01 | 1.1E+01 | na | -- | 1.9E+01 | 1.1E+01 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **1.9E+01** | **1.1E+01** | **na** | **--** | 6.61E+00 |
| Chlorobenzene | 0 | -- | -- | na | 1.6E+03 | -- | -- | na | 1.6E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.6E+03** | -- |
| Chlorodibromomethane[C] | 0 | -- | -- | na | 1.3E+02 | -- | -- | na | 1.3E+02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.3E+02** | -- |

| Parameter (ug/l unless noted) | Background Conc. | Water Quality Criteria Acute | Chronic | HH (PWS) | HH | Wasteload Allocations Acute | Chronic | HH (PWS) | HH | Antidegradation Baseline Acute | Chronic | HH (PWS) | HH | Antidegradation Allocations Acute | Chronic | HH (PWS) | HH | Most Limiting Allocations Acute | Chronic | HH (PWS) | HH | Lowest LTA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloroform | 0 | -- | -- | na | 1.1E+04 | -- | -- | na | 1.1E+04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.1E+04 | -- |
| 2-Chloronaphthalene | 0 | -- | -- | na | 1.6E+03 | -- | -- | na | 1.6E+03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.6E+03 | -- |
| 2-Chlorophenol | 0 | -- | -- | na | 1.5E+02 | -- | -- | na | 1.5E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.5E+02 | -- |
| Chlorpyrifos | 0 | 8.3E-02 | 4.1E-02 | na | -- | 8.3E-02 | 4.1E-02 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.3E-02 | 4.1E-02 | na | -- | 2.46E-02 |
| Chromium III | 0 | 1.8E+02 | 2.4E+01 | na | -- | 1.8E+02 | 2.4E+01 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8E+02 | 2.4E+01 | na | -- | 1.43E+01 |
| Chromium VI | 0 | 1.6E+01 | 1.1E+01 | na | -- | 1.6E+01 | 1.1E+01 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.6E+01 | 1.1E+01 | na | -- | 6.58E+00 |
| Chromium, Total | 0 | -- | -- | 1.0E+02 | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | -- | -- |
| Chrysene [C] | 0 | -- | -- | na | 1.8E-02 | -- | -- | na | 1.8E-02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.8E-02 | -- |
| Copper | 0 | 3.6E+00 | 2.7E+00 | na | -- | 3.6E+00 | 2.7E+00 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6E+00 | 2.7E+00 | na | -- | 1.50E+00 |
| Cyanide, Free | 0 | 2.2E+01 | 5.2E+00 | na | 1.6E+04 | 2.2E+01 | 5.2E+00 | na | 1.6E+04 | -- | -- | -- | -- | -- | -- | -- | -- | 2.2E+01 | 5.2E+00 | na | 1.6E+04 | 3.13E+00 |
| DDD [C] | 0 | -- | -- | na | 3.1E-03 | -- | -- | na | 3.1E-03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 3.1E-03 | -- |
| DDE [C] | 0 | -- | -- | na | 2.2E-03 | -- | -- | na | 2.2E-03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 2.2E-03 | -- |
| DDT [C] | 0 | 1.1E+00 | 1.0E-03 | na | 2.2E-03 | 1.1E+00 | 1.0E-03 | na | 2.2E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 1.1E+00 | 1.0E-03 | na | 2.2E-03 | 6.01E-04 |
| Demeton | 0 | -- | 1.0E-01 | na | -- | -- | 1.0E-01 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.0E-01 | na | -- | 6.01E-02 |
| Diazinon | 0 | 1.7E-01 | 1.7E-01 | na | -- | 1.7E-01 | 1.7E-01 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.7E-01 | 1.7E-01 | na | -- | 6.99E-02 |
| Dibenz(a,h)anthracene [C] | 0 | -- | -- | na | 1.8E-01 | -- | -- | na | 1.8E-01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.8E-01 | -- |
| 1,2-Dichlorobenzene | 0 | -- | -- | na | 1.3E+03 | -- | -- | na | 1.3E+03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.3E+03 | -- |
| 1,3-Dichlorobenzene | 0 | -- | -- | na | 9.6E+02 | -- | -- | na | 9.6E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 9.6E+02 | -- |
| 1,4-Dichlorobenzene | 0 | -- | -- | na | 1.9E+02 | -- | -- | na | 1.9E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.9E+02 | -- |
| 3,3-Dichlorobenzidine[C] | 0 | -- | -- | na | 2.8E-01 | -- | -- | na | 2.8E-01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 2.8E-01 | -- |
| Dichlorobromomethane [C] | 0 | -- | -- | na | 1.7E+02 | -- | -- | na | 1.7E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.7E+02 | -- |
| 1,2-Dichloroethane [C] | 0 | -- | -- | na | 3.7E+02 | -- | -- | na | 3.7E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 3.7E+02 | -- |
| 1,1-Dichloroethylene | 0 | -- | -- | na | 7.1E+03 | -- | -- | na | 7.1E+03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 7.1E+03 | -- |
| 1,2-trans-dichloroethylene | 0 | -- | -- | na | 1.0E+04 | -- | -- | na | 1.0E+04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.0E+04 | -- |
| 2,4-Dichlorophenol | 0 | -- | -- | na | 2.9E+02 | -- | -- | na | 2.9E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 2.9E+02 | -- |
| 2,4-Dichlorophenoxy acetic acid (2,4-D) | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | -- | -- |
| 1,2-Dichloropropane[C] | 0 | -- | -- | na | 1.5E+02 | -- | -- | na | 1.5E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.5E+02 | -- |
| 1,3-Dichloropropene [C] | 0 | -- | -- | na | 2.1E+02 | -- | -- | na | 2.1E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 2.1E+02 | -- |
| Dieldrin [C] | 0 | 2.4E-01 | 5.6E-02 | na | 5.4E-04 | 2.4E-01 | 5.6E-02 | na | 5.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 2.4E-01 | 5.6E-02 | na | 5.4E-04 | 3.37E-02 |
| Diethyl Phthalate | 0 | -- | -- | na | 4.4E+04 | -- | -- | na | 4.4E+04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 4.4E+04 | -- |
| 2,4-Dimethylphenol | 0 | -- | -- | na | 8.5E+02 | -- | -- | na | 8.5E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 8.5E+02 | -- |
| Dimethyl Phthalate | 0 | -- | -- | na | 1.1E+06 | -- | -- | na | 1.1E+06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.1E+06 | -- |
| Di-n-Butyl Phthalate | 0 | -- | -- | na | 4.5E+03 | -- | -- | na | 4.5E+03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 4.5E+03 | -- |
| 2,4 Dinitrophenol | 0 | -- | -- | na | 5.3E+03 | -- | -- | na | 5.3E+03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 5.3E+03 | -- |
| 2-Methyl-4,6-Dinitrophenol | 0 | -- | -- | na | 2.8E+02 | -- | -- | na | 2.8E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 2.8E+02 | -- |
| 2,4-Dinitrotoluene [C] | 0 | -- | -- | na | 3.4E+01 | -- | -- | na | 3.4E+01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 3.4E+01 | -- |
| Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin | 0 | -- | -- | na | 5.1E-08 | -- | -- | na | 5.1E-08 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 5.1E-08 | -- |
| 1,2-Diphenylhydrazine[C] | 0 | -- | -- | na | 2.0E+00 | -- | -- | na | 2.0E+00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 2.0E+00 | -- |
| Alpha-Endosulfan | 0 | 2.2E-01 | 5.6E-02 | na | 8.9E+01 | 2.2E-01 | 5.6E-02 | na | 8.9E+01 | -- | -- | -- | -- | -- | -- | -- | -- | 2.2E-01 | 5.6E-02 | na | 8.9E+01 | 3.37E-02 |
| Beta-Endosulfan | 0 | 2.2E-01 | 5.6E-02 | na | 8.9E+01 | 2.2E-01 | 5.6E-02 | na | 8.9E+01 | -- | -- | -- | -- | -- | -- | -- | -- | 2.2E-01 | 5.6E-02 | na | 8.9E+01 | 3.37E-02 |
| Alpha + Beta Endosulfan | 0 | 2.2E-01 | 5.6E-02 | -- | -- | 2.2E-01 | 5.6E-02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.2E-01 | 5.6E-02 | -- | -- | 3.37E-02 |
| Endosulfan Sulfate | 0 | -- | -- | na | 8.9E+01 | -- | -- | na | 8.9E+01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 8.9E+01 | -- |
| Endrin | 0 | 8.6E-02 | 3.6E-02 | na | 6.0E-02 | 8.6E-02 | 3.6E-02 | na | 6.0E-02 | -- | -- | -- | -- | -- | -- | -- | -- | 8.6E-02 | 3.6E-02 | na | 6.0E-02 | 2.16E-02 |
| Endrin Aldehyde | 0 | -- | -- | na | 3.0E-01 | -- | -- | na | 3.0E-01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 3.0E-01 | -- |
| Ethylbenzene | 0 | -- | -- | na | 2.1E+03 | -- | -- | na | 2.1E+03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 2.1E+03 | -- |
| Fluoranthene | 0 | -- | -- | na | 1.4E+02 | -- | -- | na | 1.4E+02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 1.4E+02 | -- |
| Fluorene | 0 | -- | -- | na | 5.3E+03 | -- | -- | na | 5.3E+03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | na | 5.3E+03 | -- |

| Parameter | Background | Water Quality Criteria | | | | Wasteload Allocations | | | | Antidegradation Baseline | | | | Antidegradation Allocations | | | | **Most Limiting Allocations** | | | | Lowest LTA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | **Acute** | **Chronic** | **HH (PWS)** | **HH** | |
| Foaming Agents | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Guthion | 0 | -- | 1.0E-02 | na | -- | -- | 1.0E-02 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **1.0E-02** | **na** | **--** | 6.01E-03 |
| Heptachlor [C] | 0 | 5.2E-01 | 3.8E-03 | na | 7.9E-04 | 5.2E-01 | 3.8E-03 | na | 7.9E-04 | -- | -- | -- | -- | -- | -- | -- | -- | **5.2E-01** | **3.8E-03** | **na** | **7.9E-04** | 2.28E-03 |
| Heptachlor Epoxide[C] | 0 | 5.2E-01 | 3.8E-03 | na | 3.9E-04 | 5.2E-01 | 3.8E-03 | na | 3.9E-04 | -- | -- | -- | -- | -- | -- | -- | -- | **5.2E-01** | **3.8E-03** | **na** | **3.9E-04** | 2.28E-03 |
| Hexachlorobenzene[C] | 0 | -- | -- | na | 2.9E-03 | -- | -- | na | 2.9E-03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **2.9E-03** | -- |
| Hexachlorobutadiene[C] | 0 | -- | -- | na | 1.8E+02 | -- | -- | na | 1.8E+02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.8E+02** | -- |
| Hexachlorocyclohexane Alpha-BHC[C] | 0 | -- | -- | na | 4.9E-02 | -- | -- | na | 4.9E-02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **4.9E-02** | -- |
| Hexachlorocyclohexane Beta-BHC[C] | 0 | -- | -- | na | 1.7E-01 | -- | -- | na | 1.7E-01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.7E-01** | -- |
| Hexachlorocyclohexane Gamma-BHC[C] (Lindane) | 0 | 9.5E-01 | na | na | 1.8E+00 | 9.5E-01 | -- | na | 1.8E+00 | -- | -- | -- | -- | -- | -- | -- | -- | **9.5E-01** | **--** | **na** | **1.8E+00** | 3.90E-01 |
| Hexachlorocyclopentadiene | 0 | -- | -- | na | 1.1E+03 | -- | -- | na | 1.1E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.1E+03** | -- |
| Hexachloroethane[C] | 0 | -- | -- | na | 3.3E+01 | -- | -- | na | 3.3E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **3.3E+01** | -- |
| Hydrogen Sulfide | 0 | -- | 2.0E+00 | na | -- | -- | 2.0E+00 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **2.0E+00** | **na** | **--** | 1.20E+00 |
| Indeno (1,2,3-cd) pyrene [C] | 0 | -- | -- | na | 1.8E-01 | -- | -- | na | 1.8E-01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.8E-01** | -- |
| Iron | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Isophorone[C] | 0 | -- | -- | na | 9.6E+03 | -- | -- | na | 9.6E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **9.6E+03** | -- |
| Kepone | 0 | -- | 0.0E+00 | na | -- | -- | 0.0E+00 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **0.0E+00** | **na** | **--** | 0.00E+00 |
| Lead | 0 | 2.0E+01 | 2.3E+00 | na | -- | 2.0E+01 | 2.3E+00 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **2.0E+01** | **2.3E+00** | **na** | **--** | 1.39E+00 |
| Malathion | 0 | -- | 1.0E-01 | na | -- | -- | 1.0E-01 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **1.0E-01** | **na** | **--** | 6.01E-02 |
| Manganese | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Mercury | 0 | 1.4E+00 | 7.7E-01 | - - | - - | 1.4E+00 | 7.7E-01 | - - | - - | -- | -- | -- | -- | -- | -- | -- | -- | **1.4E+00** | **7.7E-01** | **- -** | **- -** | 4.63E-01 |
| Methyl Bromide | 0 | -- | -- | na | 1.5E+03 | -- | -- | na | 1.5E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.5E+03** | -- |
| Methylene Chloride [C] | 0 | -- | -- | na | 5.9E+03 | -- | -- | na | 5.9E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **5.9E+03** | -- |
| Methoxychlor | 0 | -- | 3.0E-02 | na | -- | -- | 3.0E-02 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **3.0E-02** | **na** | **--** | 1.80E-02 |
| Mirex | 0 | -- | 0.0E+00 | na | -- | -- | 0.0E+00 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **0.0E+00** | **na** | **--** | 0.00E+00 |
| Nickel | 0 | 5.6E+01 | 6.3E+00 | na | 4.6E+03 | 5.6E+01 | 6.3E+00 | na | 4.6E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **5.6E+01** | **6.3E+00** | **na** | **4.6E+03** | 3.77E+00 |
| Nitrate (as N) | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Nitrobenzene | 0 | -- | -- | na | 6.9E+02 | -- | -- | na | 6.9E+02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **6.9E+02** | -- |
| N-Nitrosodimethylamine[C] | 0 | -- | -- | na | 3.0E+01 | -- | -- | na | 3.0E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **3.0E+01** | -- |
| N-Nitrosodiphenylamine[C] | 0 | -- | -- | na | 6.0E+01 | -- | -- | na | 6.0E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **6.0E+01** | -- |
| N-Nitrosodi-n-propylamine[C] | 0 | -- | -- | na | 5.1E+00 | -- | -- | na | 5.1E+00 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **5.1E+00** | -- |
| Nonylphenol | 0 | 2.8E+01 | 6.6E+00 | -- | -- | 2.8E+01 | 6.6E+00 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **2.8E+01** | **6.6E+00** | **na** | **--** | 3.97E+00 |
| Parathion | 0 | 6.5E-02 | 1.3E-02 | na | -- | 6.5E-02 | 1.3E-02 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **6.5E-02** | **1.3E-02** | **na** | **--** | 7.81E-03 |
| PCB Total[C] | 0 | -- | 1.4E-02 | na | 6.4E-04 | -- | 1.4E-02 | na | 6.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **1.4E-02** | **na** | **6.4E-04** | 8.42E-03 |
| Pentachlorophenol [C] | 0 | 1.6E+00 | 1.2E+00 | na | 3.0E+01 | 1.6E+00 | 1.2E+00 | na | 3.0E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **1.6E+00** | **1.2E+00** | **na** | **3.0E+01** | 6.49E-01 |
| Phenol | 0 | -- | -- | na | 8.6E+05 | -- | -- | na | 8.6E+05 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **8.6E+05** | -- |
| Pyrene | 0 | -- | -- | na | 4.0E+03 | -- | -- | na | 4.0E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **4.0E+03** | -- |
| Radionuclides | | | | | | | | | | | | | | | | | | | | | | |
| Gross Alpha Activity (pCi/L) | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Beta and Photon Activity (mrem/yr) | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | -- | -- |
| Radium 226 + 228 (pCi/L) | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Uranium (ug/l) | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Selenium, Total Recoverable | 0 | 2.0E+01 | 5.0E+00 | na | 4.2E+03 | 2.0E+01 | 5.0E+00 | na | 4.2E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **2.0E+01** | **5.0E+00** | **na** | **4.2E+03** | 3.01E+00 |
| Silver | 0 | 3.2E-01 | -- | na | -- | 3.2E-01 | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **3.2E-01** | **--** | **na** | **--** | 1.31E-01 |
| Sulfate | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| 1,1,2,2-Tetrachloroethane[C] | 0 | -- | -- | na | 4.0E+01 | -- | -- | na | 4.0E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **4.0E+01** | -- |
| Tetrachloroethylene[C] | 0 | -- | -- | na | 3.3E+01 | -- | -- | na | 3.3E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **3.3E+01** | -- |

| Parameter (ug/l unless noted) | Background Conc. | Water Quality Criteria Acute | Chronic | HH (PWS) | HH | Wasteload Allocations Acute | Chronic | HH (PWS) | HH | Antidegradation Baseline Acute | Chronic | HH (PWS) | HH | Antidegradation Allocations Acute | Chronic | HH (PWS) | HH | **Most Limiting Allocations** **Acute** | **Chronic** | **HH (PWS)** | **HH** | Lowest LTA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thallium | 0 | -- | -- | na | 4.7E-01 | -- | -- | na | 4.7E-01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **4.7E-01** | -- |
| Toluene | 0 | -- | -- | na | 6.0E+03 | -- | -- | na | 6.0E+03 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **6.0E+03** | -- |
| Total dissolved solids | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Toxaphene C | 0 | 7.3E-01 | 2.0E-04 | na | 2.8E-03 | 7.3E-01 | 2.0E-04 | na | 2.8E-03 | -- | -- | -- | -- | -- | -- | -- | -- | **7.3E-01** | **2.0E-04** | **na** | **2.8E-03** | 1.20E-04 |
| Tributyltin | 0 | 4.6E-01 | 7.2E-02 | na | -- | 4.6E-01 | 7.2E-02 | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **4.6E-01** | **7.2E-02** | **na** | **--** | 4.33E-02 |
| 1,2,4-Trichlorobenzene | 0 | -- | -- | na | 7.0E+01 | -- | -- | na | 7.0E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **7.0E+01** | -- |
| 1,1,2-Trichloroethane C | 0 | -- | -- | na | 1.6E+02 | -- | -- | na | 1.6E+02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **1.6E+02** | -- |
| Trichloroethylene C | 0 | -- | -- | na | 3.0E+02 | -- | -- | na | 3.0E+02 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **3.0E+02** | -- |
| 2,4,6-Trichlorophenol C | 0 | -- | -- | na | 2.4E+01 | -- | -- | na | 2.4E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **2.4E+01** | -- |
| 2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex) | 0 | -- | -- | na | -- | -- | -- | na | -- | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **--** | -- |
| Vinyl Chloride C | 0 | -- | -- | na | 2.4E+01 | -- | -- | na | 2.4E+01 | -- | -- | -- | -- | -- | -- | -- | -- | **--** | **--** | **na** | **2.4E+01** | -- |
| Zinc | 0 | 3.6E+01 | 3.6E+01 | na | 2.6E+04 | 3.6E+01 | 3.6E+01 | na | 2.6E+04 | -- | -- | -- | -- | -- | -- | -- | -- | **3.6E+01** | **3.6E+01** | **na** | **2.6E+04** | 1.49E+01 |

Notes:
1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and
   Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

| Metal | Target Value (SSTV) |
|---|---|
| Antimony | 6.4E+02 |
| Arsenic | 9.0E+01 |
| Barium | na |
| Cadmium | 2.3E-01 |
| Chromium III | 1.4E+01 |
| Chromium VI | 6.4E+00 |
| Copper | 1.5E+00 |
| Iron | na |
| Lead | 1.4E+00 |
| Manganese | na |
| Mercury | 4.6E-01 |
| Nickel | 3.8E+00 |
| Selenium | 3.0E+00 |
| Silver | 1.3E-01 |
| Zinc | 1.4E+01 |

Note: do not use QL's lower than the minimum QL's provided in agency guidance

**Temperature Screening: (Non-heated Discharge)**

NOTE: The temperature screening below roughly evaluates the projected rise in temperature within the mixing zone during low flow conditions using 90%tile effluent temperature, and either 10%tile ambient temperature for heated discharges or 90%tile ambient temperature for non-heated discharges . This screening is for informational purposes only, and should not be used for limitation development.

1Q10 Acute - Maximum Allowable Rise Over Ambient = **2 °C**

Mix 1Q10 Temperature (Non-heated Discharge)

$$\frac{((0 \text{ MGD} \times 27.2^\circ C) + (0.02127 \text{ MGD} \times 27.2^\circ C))}{(0.02127 \text{ MGD})} = 27.2\ ^\circ C$$

**ΔT °C** above ambient ► 27.2 °C - 27.2°C = **0 °C**

7Q10 Chronic - Maximum Allowable Rise Over Ambient = **3 °C**

Mix 7Q10 Temperature (Non-heated Discharge)

$$\frac{((0 \text{ MGD} \times 27.2^\circ C) + (0.02127 \text{ MGD} \times 27.2^\circ C))}{(0.02127 \text{ MGD})} = 27.2\ ^\circ C$$

**ΔT °C** above ambient ► 27.2 °C - 27.2°C = **0 °C**

12/21/2012 10:45:55 AM

```
Facility  = Surry Power Station & Gravel Neck
Chemical  = Ammonia (002)
Chronic averaging period =  30
WLAa    =  50.5
WLAc    =  2.98
Q.L.      = 0.002
# samples/mo. = 1
# samples/wk. = 1
```

Summary of Statistics:

```
# observations = 1
Expected Value =  .02
Variance       =  .000144
C.V.           = 0.6
97th percentile daily values  =  .048668
97th percentile 4 day average =  .033275
97th percentile 30 day average=  .024121
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```

No Limit is required for this material

The data are:

0.02

8/2/2012 11:49:10 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Arsenic, total recoverable
Chronic averaging period = 4
WLAa = 340
WLAc = 150
Q.L. = 1.4
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 26
Variance = 243.36
C.V. = 0.6
97th percentile daily values = 63.2688
97th percentile 4 day average = 43.2585
97th percentile 30 day average= 31.3573
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

26

8/2/2012 11:49:45 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Arsenic, dissolved
Chronic averaging period = 4
WLAa = 340
WLAc = 150
Q.L. = 1.4
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 26
Variance = 243.36
C.V. = 0.6
97th percentile daily values = 63.2688
97th percentile 4 day average = 43.2585
97th percentile 30 day average= 31.3573
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

26

8/2/2012 11:55:40 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Chlorides
Chronic averaging period = 4
WLAa = 860
WLAc = 230
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 2.66
Variance = 2.54721
C.V. = 0.6
97th percentile daily values = 6.47289
97th percentile 4 day average = 4.42568
97th percentile 30 day average= 3.20810
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

2.66

8/2/2012 11:50:33 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Chromium, total
Chronic averaging period = 4
WLAa = 180
WLAc = 24
Q.L. = 0.6
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025
97th percentile 4 day average = 4.99137
97th percentile 30 day average= 3.61815
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3

8/2/2012 11:38:19 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Chromium III, dissolved
Chronic averaging period = 4
WLAa = 180
WLAc = 24
Q.L. = 0.3
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025
97th percentile 4 day average = 4.99137
97th percentile 30 day average= 3.61815
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3

8/2/2012 11:39:14 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Chromium VI, dissolved
Chronic averaging period = 4
WLAa = 16
WLAc = 11
Q.L. = 1.6
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 5
Variance = 9
C.V. = 0.6
97th percentile daily values = 12.1670
97th percentile 4 day average = 8.31895
97th percentile 30 day average= 6.03026
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5

8/2/2012 12:49:39 PM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Copper, dissolved
Chronic averaging period = 4
WLAa = 3.6
WLAc = 2.7
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 10
Expected Value = 14.0017
Variance = 144.031
C.V. = 0.857129
97th percentile daily values = 42.9397
97th percentile 4 day average = 27.8621
97th percentile 30 day average= 18.1232
# < Q.L. = 0
Model used = lognormal

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 3.6
Average Weekly limit = 3.6
Average Monthly LImit = 3.6

The data are:

8
22
29
4
7
7
16
6
32
6

8/2/2012 11:52:41 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Copper, total
Chronic averaging period = 4
WLAa = 3.6
WLAc = 2.7
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 8
Variance = 23.04
C.V. = 0.6
97th percentile daily values = 19.4673
97th percentile 4 day average = 13.3103
97th percentile 30 day average= 9.64842
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 3.6
Average Weekly limit = 3.6
Average Monthly LImit = 3.6

The data are:

8

8/2/2012 11:42:41 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Lead, dissolved
Chronic averaging period = 4
WLAa = 20
WLAc = 2.3
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1

8/2/2012 11:43:48 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Nickel, dissolved
Chronic averaging period = 4
WLAa = 56
WLAc = 6.3
Q.L. = 0.94
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 5
Variance = 9
C.V. = 0.6
97th percentile daily values = 12.1670
97th percentile 4 day average = 8.31895
97th percentile 30 day average= 6.03026
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 9.21422113953536
Average Weekly limit = 9.21422113953536
Average Monthly LImit = 9.21422113953536

The data are:

5

8/2/2012 11:53:49 AM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Selenium, total recoverable
Chronic averaging period = 4
WLAa = 20
WLAc = 5
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025
97th percentile 4 day average = 4.99137
97th percentile 30 day average= 3.61815
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3

8/2/2012 12:51:17 PM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Zinc, dissolved
Chronic averaging period = 4
WLAa = 36
WLAc = 36
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 10
Expected Value = 135.935
Variance = 18446.7
C.V. = 0.999141
97th percentile daily values = 459.943
97th percentile 4 day average = 295.493
97th percentile 30 day average= 182.578
# < Q.L. = 0
Model used = lognormal

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 36
Average Weekly limit = 36
Average Monthly LImit = 36

The data are:

182
77
231
180
282
22
72
59
119
37

8/2/2012 12:25:38 PM

Facility = Surry Power Station & Gravel Neck (002)
Chemical = Zinc, total recoverable
Chronic averaging period = 4
WLAa = 36
WLAc = 36
Q.L. = 2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 42
Variance = 635.04
C.V. = 0.6
97th percentile daily values = 102.203
97th percentile 4 day average = 69.8791
97th percentile 30 day average= 50.6542
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 36
Average Weekly limit = 36
Average Monthly LImit = 36

The data are:

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# Attachment I

Federal Effluent Guidelines (Steam Electric Power Generating Cat.)

section, which may be discharged by a point source subject to the provisions of this subpart after application of the standards of performance for new sources:

[Metric units (kg/kkg of product); English units (lb/1,000 lb of product)]

| Effluent characteristic | Effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed— |
| TSS | 0.35 | 0.18 |
| Total phosphorus (as P) | .56 | .28 |
| Fluoride (as F) | .21 | .11 |
| pH | (1) | (1) |

[1] Within the range 6.0 to 9.5.

### § 422.66 [Reserved]

### § 422.67 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

[Metric units (kg/kkg of product); English units (lb/1,000 lb of product)]

| Effluent characteristic | Effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed— |
| TSS | 0.35 | 0.18 |
| pH | (1) | (1) |

[1] Within the range 6.0 to 9.5.

[51 FR 25000, July 9, 1986]

# PART 423—STEAM ELECTRIC POWER GENERATING POINT SOURCE CATEGORY

Sec.



AUTHORITY: Secs. 301; 304(b), (c), (e), and (g); 306(b) and (c); 307(b) and (c); and 501, Clean Water Act (Federal Water Pollution Control Act Amendments of 1972, as amended by Clean Water Act of 1977) (the ''Act''; 33 U.S.C. 1311; 1314(b), (c), (e), and (g); 1316(b) and (c); 1317(b) and (c); and 1361; 86 Stat. 816, Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217), unless otherwise noted.

SOURCE: 47 FR 52304, Nov. 19, 1982, unless otherwise noted.

### § 423.10 Applicability.

The provisions of this part are applicable to discharges resulting from the operation of a generating unit by an establishment primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium.

### § 423.11 Specialized definitions.

In addition to the definitions set forth in 40 CFR part 401, the following definitions apply to this part:

(a) The term *total residual chlorine* (or total residual oxidants for intake water with bromides) means the value obtained using the amperometric method for total residual chlorine described in 40 CFR part 136.

(b) The term *low volume waste sources* means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations are otherwise established in this part. Low volume wastes sources include, but are not limited to:

wastewaters from wet scrubber air pollution control systems, ion exchange water treatment system, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, and recirculating house service water systems. Sanitary and air conditioning wastes are not included.

(c) The term *chemical metal cleaning waste* means any wastewater resulting from the cleaning of any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning.

(d) The term *metal cleaning waste* means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

(e) The term *fly ash* means the ash that is carried out of the furnace by the gas stream and collected by mechanical precipitators, electrostatic precipitators, and/or fabric filters. Economizer ash is included when it is collected with fly ash.

(f) The term *bottom ash* means the ash that drops out of the furnace gas stream in the furnace and in the economizer sections. Economizer ash is included when it is collected with bottom ash.

(g) The term *once through cooling water* means water passed through the main cooling condensers in one or two passes for the purpose of removing waste heat.

(h) The term *recirculated cooling water* means water which is passed through the main condensers for the purpose of removing waste heat, passed through a cooling device for the purpose of removing such heat from the water and then passed again, except for blowdown, through the main condenser.

(i) The term *10 year, 24/hour rainfall event* means a rainfall event with a probable recurrence interval of once in ten years as defined by the National Weather Service in Technical Paper No. 40. *Rainfall Frequency Atlas of the United States*, May 1961 or equivalent regional rainfall probability information developed therefrom.

(j) The term *blowdown* means the minimum discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentration in amounts exceeding limits established by best engineering practices.

(k) The term *average concentration* as it relates to chlorine discharge means the average of analyses made over a single period of chlorine release which does not exceed two hours.

(l) The term *free available chlorine* shall mean the value obtained using the amperometric titration method for free available chlorine described in *Standard Methods for the Examination of Water and Wastewater*, page 112 (13th edition).

(m) The term *coal pile runoff* means the rainfall runoff from or through any coal storage pile.

### § 423.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) In establishing the limitations set forth in this section, EPA took into account all information it was able to collect, develop and solicit with respect to factors (such as age and size of plant, utilization of facilities, raw materials, manufacturing processes, nonwater quality environmental impacts, control and treatment technology available, energy requirements and costs) which can affect the industry subcategorization and effluent levels established. It is, however, possible that data which would affect these limitations have not been available and, as a result, these limitations should be adjusted for certain plants in this industry. An individual discharger or other interested person may submit evidence to the Regional Administrator (or to the State, if the State has the authority to issue NPDES permits) that factors relating to the equipment or facilities involved, the process applied, or other such factors related to such discharger are fundamentally different from the factors considered in the establishment of the guidelines. On the basis of such evidence or other available information, the Regional

Administrator (or the State) will make a written finding that such factors are or are not fundamentally different for that facility compared to those specified in the Development Document. If such fundamentally different factors are found to exist, the Regional Administrator or the State shall establish for the discharger effluent limitations in the NPDES Permit either more or less stringent than the limitations established herein, to the extent dictated by such fundamentally different factors. Such limitations must be approved by the Administrator of the Environmental Protection Agency. The Administrator may approve or disapprove such limitations, specify other limitations, or initiate proceedings to revise these regulations. The phrase ''other such factors'' appearing above may include significant cost differentials. In no event may a discharger's impact on receiving water quality be considered as a factor under this paragraph.

(b) Any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction by the application of the best practicable control technology currently available (BPT):

(1) The pH of all discharges, except once through cooling water, shall be within the range of 6.0–9.0.

(2) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(3) The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the concentration lised in the following table:

| Pollutant or pollutant property | BPT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day (mg/l) | Average of daily values for 30 consecutive days shall not exceed (mg/l) |
| TSS | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |

(4) The quantity of pollutants discharged in fly ash and bottom ash transport water shall not exceed the quantity determined by multiplying the flow of fly ash and bottom ash transport water times the concentration listed in the following table:

| Pollutant or pollutant property | BPT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day (mg/l) | Average of daily values for 30 consecutive days shall not exceed (mg/l) |
| TSS | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |

(5) The quantity of pollutants discharged in metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of metal cleaning wastes times the concentration listed in the following table:

| Pollutant or pollutant property | BPT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day (mg/l) | Average of daily values for 30 consecutive days shall not exceed (mg/l) |
| TSS | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |
| Copper, total | 1.0 | 1.0 |
| Iron, total | 1.0 | 1.0 |

(6) The quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentation listed in the following table:

| Pollutant or pollutant property | BPT effluent limitations | |
|---|---|---|
| | Maximum concentration (mg/l) | Average concentration (mg/l) |
| Free available chlorine | 0.5 | 0.2 |

(7) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown sources times the concentration listed in the following table:

| Pollutant or pollutant property | BPT effluent limitations | |
|---|---|---|
| | Maximum concentration (mg/l) | Average concentration (mg/l) |
| Free available chlorine | 0.5 | 0.2 |

(8) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level or chlorination.

(9) Subject to the provisions of paragraph (b)(10) of this section, the following effluent limitations shall apply to the point source discharges of coal pile runoff:

| Pollutant or pollutant property | BPT effluent limitations |
|---|---|
| | Maximum concentration for any time (mg/l) |
| TSS | 50 |

(10) Any untreated overflow from facilities designed, constructed, and operated to treat the volume of coal pile runoff which is associated with a 10 year, 24 hour rainfall event shall not be subject to the limitations in paragraph (b)(9) of this section.

(11) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitations specified in paragraphs (b)(3) through (7) of this section. Concentration limitations shall be those concentrations specified in this section.

(12) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (11) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

(The information collection requirements contained in paragraph (a) were approved by the Office of Management and Budget under control number 2000–0194)

[47 FR 52304, Nov. 19, 1982, as amended at 48 FR 31404, July 8, 1983]

## § 423.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this part must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(b)(1) For any plant with a total rated electric generating capacity of 25 or more megawatts, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water from each discharge point times the concentration listed in the following table:

| Pollutant or pollutant property | BAT Effluent Limitations |
|---|---|
| | Maximum concentration (mg/l) |
| Total residual chlorine | 0.20 |

(2) Total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.

(c)(1) For any plant with a total rated generating capacity of less than 25 megawatts, the quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum concentration (mg/l) | Average concentration (mg/l) |
| Free available chlorine | 0.5 | 0.2 |

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(d)(1) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the concentration listed below:

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum concentration (mg/l) | Average concentration (mg/l) |
| Free available chlorine | 0.5 | 0.2 |

| Pollutant or pollutant property | Maximum for any 1 day – (mg/l) | Average of daily values for 30 consecutive days shall not exceed =(mg/l) |
|---|---|---|
| The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except: | (1) | (1) |
| Chromium, total | 0.2 | 0.2 |
| Zinc, total | 1.0 | 1.0 |

[1] No detectable amount.

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(3) At the permitting authority's discretion, instead of the monitoring specified in 40 CFR 122.11(b) compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

(e) The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentration listed in the following table:

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day (mg/l) | Average of daily values for 30 consecutive days shall not exceed – (mg/l) |
| Copper, total | 1.0 | 1.0 |
| Iron, total | 1.0 | 1.0 |

(f) [Reserved—Nonchemical Metal Cleaning Wastes].

(g) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitations specified in paragraphs (b) through (e) of this section. Concentration limitations shall be those concentrations specified in this section.

(h) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (g) of this section attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

(The information collection requirements contained in paragraphs (c)(2) and (d)(2) were approved by the Office of Management and Budget under control number 2040–0040. The information collection requirements contained in paragraph (d)(3) were approved under control number 2040–0033.)

[47 FR 52304, Nov. 19, 1982, as amended at 48 FR 31404, July 8, 1983]

**§423.14 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]**

**§423.15 New source performance standards (NSPS).**

Any new source subject to this subpart must achieve the following new source performance standards:

(a) The pH of all discharges, except once through cooling water, shall be within the range of 6.0–9.0.

(b) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(c) The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the concentration listed in the following table:

| Pollutant or pollutant property | NSPS effluent limitations | |
|---|---|---|
| | Maximum for any 1 day (mg/l) | Average of daily values for 30 consecutive days shall not exceed (mg/l) |
| TSS | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |

(d) The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentration listed in the following table:

| Pollutant or pollutant property | NSPS effluent limitations | |
|---|---|---|
| | Maximum for any 1 day (mg/l) | Average of daily values for 30 consecutive days shall not exceed (mg/l) |
| TSS | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |
| Copper, total | 1.0 | 1.0 |
| Iron, total | 1.0 | 1.0 |

(e) [Reserved—Nonchemical Metal Cleaning Wastes].

(f) The quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of the bottom ash transport water times the concentration listed in the following table:

| Pollutant or pollutant property | NSPS effluent limitations | |
|---|---|---|
| | Maximum for any 1 day (mg/l) | Average of daily values for 30 consecutive days shall not exceed (mg/l) |
| TSS | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |

(g) There shall be no discharge of wastewater pollutants from fly ash transport water.

(h)(1) For any plant with a total rated electric generating capacity of 25 or more megawatts, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water from each discharge point times the concentration listed in the following table:

| Pollutant or pollutant property | NSPS effluent limitations |
|---|---|
| | Maximum concentration (mg/l) |
| Total residual chlorine | 0.20 |

(2) Total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.

(i)(1) For any plant with a total rated generating capacity of less than 25 megawatts, the quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:

| Pollutant of pollutant property | NSPS effluent limitations | |
|---|---|---|
| | Maximum concentration (mg/l) | Average concentration (mg/l) |
| Free available chlorine | 0.5 | 0.2 |

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(j)(1) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the concentration listed below:

| Pollutant or pollutant property | NSPS effluent limitations | |
|---|---|---|
| | Maximum concentration (mg/l) | Average concentration (mg/l) |
| Free available chlorine | 0.5 | 0.2 |

| Pollutant or pollutant property | Maximum for any 1 day (mg/l) | Average of daily values for 30 consecutive days shall not exceed – (mg/l) |
|---|---|---|
| The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except: | [1] | [1] |
| Chromium, total | 0.2 | 0.2 |
| Zinc, total | 1.0 | 1.0 |

[1] No detectable amount.

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(3) At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (j)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

(k) Subject to the provisions of § 423.15(l), the quantity or quality of pollutants or pollutant parameters discharged in coal pile runoff shall not exceed the limitations specified below:

| Pollutant or pollutant property | NSPS effluent limitations for any time |
|---|---|
| TSS | Not to exceed 50 mg/l. |

(l) Any untreated overflow from facilities designed, constructed, and operated to treat the coal pile runoff which results from a 10 year, 24 hour rainfall event shall not be subject to the limitations in § 423.15(k).

(m) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitation specified in paragraphs (c) through (j) of this section. Concentration limits shall be based on the concentrations specified in this section.

(n) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (m) of this section attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

(The information collection requirements contained in paragraphs (h)(2), (i)(2), and (j)(2) were approved by the Office of Management and Budget under control number 2040–0040. The information collection requirements contained in paragraph (j)(3) were approved under control number 2040–0033.)

[47 FR 52304, Nov. 19, 1982, as amended at 48 FR 31404, July 8, 1983]

## § 423.16 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for existing sources (PSES) by July 1, 1984:

(a) There shall be no discharge of polychlorinated biphenol compounds such as those used for transformer fluid.

(b) The pollutants discharged in chemical metal cleaning wastes shall not exceed the concentration listed in the following table:

| Pollutant or pollutant property | PSES pretreatment standards |
|---|---|
| | Maximum for 1 day (mg/l) |
| Copper, total | 1.0 |

(c) [Reserved—Nonchemical Metal Cleaning Wastes].

(d)(1) The pollutants discharged in cooling tower blowdown shall not exceed the concentration listed in the following table:

| Pollutant or pollutant property | PSES pretreatment standards |
|---|---|
| | Maximum for any time (mg/l) |
| The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except: | ([1]) |
| Chromium, total | 0.2 |
| Zinc, total | 1.0 |

[1] No detectable amount.

(2) At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

### § 423.17 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart part which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and the following pretreatment standards for new sources (PSNS).

(a) There shall be no discharge of polychlorinated biphenyl compounds such as those used for transformer fluid.

(b) The pollutants discharged in chemical metal cleaning wastes shall not exceed the concentration listed in the following table:

| Pollutant or pollutant property | PSNS pretreatment standards |
|---|---|
| | Maximum for 1 day (mg/l) |
| Copper, total | 1.0 |

(c) [Reserved—Nonchemical Metal Cleaning Wastes].

(d)(1) The pollutants discharged in cooling tower blowdown shall not exceed the concentration listed in the following table:

| Pollutant or pollutant property | PSNS pretreatment standards |
|---|---|
| | Maximum for any time (mg/l) |
| The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except: | |
| Chromium, total | 0.2 |
| Zinc, total | 1.0 |

(2) At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

(e) There shall be no discharge of wastewater pollutants from fly ash transport water.

## Appendix A to Part 423—126 Priority Pollutants

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
011 1,1,1-trichloreothane
012 Hexachloroethane
013 1,1-dichloroethane
014 1,1,2-trichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
018 Bis(2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
021 2,4, 6-trichlorophenol
022 Parachlorometa cresol
023 Chloroform (trichloromethane)

024 2-chlorophenol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2-trans-dichloroethylene
031 2,4-dichlorophenol
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
038 Ethylbenzene
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
044 Methylene chloride (dichloromethane)
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
048 Dichlorobromomethane
051 Chlorodibromomethane
052 Hexachlorobutadiene
053 Hexachloromyclopentadiene
054 Isophorone
055 Naphthalene
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamin
064 Pentachlorophenol
065 Phenol
066 Bis(2-ethylhexyl) phthalate
067 Butyl benzyl phthalate
068 Di-N-Butyl Phthalate
069 Di-n-octyl phthalate
070 Diethyl Phthalate
071 Dimethyl phthalate
072 1,2-benzanthracene (benzo(a) anthracene
073 Benzo(a)pyrene (3,4-benzo-pyrene)
074 3,4-Benzofluoranthene (benzo(b) fluoranthene)
075 11,12-benzofluoranthene (benzo(b) fluoranthene)
076 Chrysene
077 Acenaphthylene
078 Anthracene
079 1,12-benzoperylene (benzo(ghi) perylene)
080 Fluorene
081 Phenanthrene
082 1,2,5,6-dibenzanthracene (dibenzo(,h) anthracene)
083 Indeno (,1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
084 Pyrene
085 Tetrachloroethylene
086 Toluene
087 Trichloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB–1242 (Arochlor 1242)
107 PCB–1254 (Arochlor 1254)
108 PCB–1221 (Arochlor 1221)
109 PCB–1232 (Arochlor 1232)
110 PCB–1248 (Arochlor 1248)
111 PCB–1260 (Arochlor 1260)
112 PCB–1016 (Arochlor 1016)
113 Toxaphene
114 Antimony
115 Arsenic
116 Asbestos
117 Beryllium
118 Cadmium
119 Chromium
120 Copper
121 Cyanide, Total
122 Lead
123 Mercury
124 Nickel
125 Selenium
126 Silver
127 Thallium
126 Silver
128 Zinc
129 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

# PART 424—FERROALLOY MANUFACTURING POINT SOURCE CATEGORY

## Subpart A—Open Electric Furnaces With Wet Air Pollution Control Devices Subcategory

# Attachment J

WET Evaluation and Associated OWP&CA Guidance

## Kazio, Jeremy (DEQ)

**From:** DeBiasi, Deborah (DEQ)
**Sent:** Friday, November 09, 2012 4:54 PM
**To:** Kazio, Jeremy (DEQ)
**Subject:** RE: TMP for VA0004090 Surry Power Station and Gravel Neck - 2013 permit reissuance

Jeremy,

As always, I appreciate the comprehensive analysis that you provide – it makes my review a lot easier!

The only thing I would add is the word "statistically" below, and then it's fine for me! Thanks!

b. The test dilutions should be able to determine compliance with the following endpoint(s):

Chronic NOEC of **48%**, equivalent to a $TU_c$ of **2.08**.

The test data will be evaluated statistically for reasonable poten


Deborah L. DeBiasi, Virginia DEQ
Office of Water Permit and Compliance Assistance Programs
**Email: Deborah.DeBiasi@deq.virginia.gov**
PH: 804-698-4028


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**From:** Kazio, Jeremy (DEQ)
**Sent:** Friday, November 09, 2012 3:33 PM
**To:** DeBiasi, Deborah (DEQ)
**Subject:** TMP for VA0004090 Surry Power Station and Gravel Neck - 2013 permit reissuance

Hello Deborah,

I am reissuing the VEPCO Dominion Surry Power Station and Gravel Neck VPDES permit and need your concurrence on the proposed WET language and monitoring requirements that I plan to carry forward from the 2007 permit to the 2013 permit.

**Facility Description:**

Surry Power Station and Gravel Neck CT Station are two electric power generating facilities owned by Dominion that are co-located in Surry County adjacent to the Hog Island WMR. The two facilities have interconnected wastewater discharges and, therefore, are permitted under the same VPDES permit. There are two process outfalls, Outfall 001 and Outfall 002, that discharge to State waters.

The Surry Power Station is a nuclear fueled steam electric facility that discharges approximately 2.3 billion gallons per day of once-through cooling water, sourced from the James River, and discharged through Outfall 001 (a.k.a. the discharge canal) back into the James River. The facility has 22 internal outfalls with a conglomerated discharge of, in a worst case scenario, approximately 3.5 million gallons per day of low volume waste, or about 1.5% of the final effluent volume. A large number of these internal outfalls are intermittent discharges.

The Gravel Neck facility consists of four combustion turbines and serves as a backup to the nuclear station in the event of heavy power use or an outage. The combustion turbines are fueled mainly by natural gas, but #2 fuel oil may be used as an auxiliary fuel. The second outfall, Outfall 002, discharges untreated storm water from this facility that collects within a dirt containment berm surrounding a single 320,000 gallon #2 fuel oil tank.

Due to the complexity of how the various wastewater discharges are routed between the Surry and Gravel Neck plants, I have uploaded the 2013 draft permit and fact sheet to the T:drive for your review and in case you have any detailed questions. You can access them by clicking HERE.

**Historic WET Monitoring:**

In past permit reissuances, WET requirements have been applied to Outfall 001 only, and have included the Chronic Static Renewal 7-Day Survival, Growth, and Fecundity Test using *Americamysis bahia.* The 2007 permit required a chronic endpoint of NOEC = 48% equivalent to a TUc = 2.08. The permittee has historically employed Coastal Bioanalysts to conduct their WET tests. Test results submitted to DEQ between May 2002 and July 2011 **all** indicated NOEC results of 100% and 48 hour LC50s of ≥100%. Since they're all the same, I didn't think you needed to see this in chart form, but if you want I can revise this memo to reflect the results that way.

**Proposed WET Requirements:**

Continued chronic testing is recommended for the 2013 permit reissuance.

The WETLIM10 spreadsheet is attached. The test endpoint in the proposed permit will be a NOEC of 48%, same as historic requirements. The mixing ratios used in the spreadsheet are taken from a study titled "Mixing and Dilution of the Surry Nuclear Power Plant Cooling Water Discharge into the James River" performed by VIMS and submitted to DEQ on August 11, 1995 (see Attachment A of the draft fact sheet linked above). Per the note at the bottom of "Table 4", the inverse of the concentrations presented in the table is defined to be the minimum dilution of the cooling water flow in the river. The inverse calculations, which are the mix ratios used in MSTRANTI, are as follows: 1Q10 – 1.43, 7Q10 – 1.45, and 30Q5 – 1.52.

For the 2013 permit, WETLIM indicated that the same WLAs (WLAa,c=4.29, WLAc=1.45) and endpoints (NOEC=48%, TUc=2.08) as the 2007 permit are applicable to the 2013 permit. Therefore, I propose to use similar permit language as the 2007 permit (see below). Please let me know if this is appropriate, and if not, please feel free to recommend any changes you think would enhance the language or monitoring requirements. Thanks!!

-----------------------------------------------------------------------------

Whole Effluent Toxicity (WET) Monitoring Program

a. Biological Monitoring:

In accordance with the schedule in Part I.C.28.c of this permit, the permittee shall perform annual toxicity testing using 24-hour flow-proportioned composite samples of final effluent from Outfall 001.

(1) The chronic test to use is the Chronic Static Renewal 7-Day Survival, Growth, and Fecundity Test using *Americamysis bahia.*

(2) These chronic tests shall be conducted in such a manner and at sufficient dilutions (minimum of five dilutions, derived geometrically) to determine the "No Observed Effect Concentration" (NOEC) for survival, growth, and fecundity. Results which cannot be determined (i.e., a "less than" NOEC value) are not acceptable, and a retest shall be performed. The test NOEC should be expressed using Chronic Toxic Units ($TU_c$), which are determined by dividing the NOEC value into 100 (100/NOEC), if reported on the DMR. The $LC_{50}$ at 48 hours and the $IC_{25}$ with the NOEC's shall also be included in the test report.

b. The test dilutions should be able to determine compliance with the following endpoint(s):

Chronic NOEC of **48%**, equivalent to a $TU_c$ of **2.08**.

The test data will be evaluated statistically for reasonable potential at the conclusion of the permit term, or sooner if toxicity has been noted. Should evaluation of the data indicate that a limit is needed, a WET limit and compliance schedule will be required and the toxicity tests in Part I.C.28.a may be discontinued.

The permittee may provide additional samples to address data variability; these data shall be reported and may be included in the evaluation of effluent toxicity. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3

c. Reporting Schedule:

The permittee shall submit a copy of each toxicity test report specified in this Toxics Management Program in accordance with the following schedule:

| Compliance Date | Submittal Date |
|---|---|
| 01/01/2013 - 12/31/2013 | By 01/10/2014 |
| 01/01/2014 - 12/31/2014 | By 01/10/2015 |
| 01/01/2015 - 12/31/2015 | By 01/10/2016 |
| 01/01/2016 - 12/31/2016 | By 01/10/2017 |

# Spreadsheet for determination of WET test endpoints or WET limits

**Excel 97**
**Revision Date: 01/10/05**
**File: WETLIM10.xls**
**(MIX.EXE required also)**

**Acute Endpoint/Permit Limit** — **Use as $LC_{50}$ in Special Condition, as TUa on DMR**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ACUTE** | **100% =** | **NOAEC** | **$LC_{50}$ =** | **NA** | % Use as | **NA** | **TUa** |
| **ACUTE WLAa** | | **0.429** | Note: Inform the permittee that if the mean of the data exceeds | | | | |
| | | | this TUa: | **1.0** | a limit may result using WLA.EXE | | |

**Chronic Endpoint/Permit Limit** — **Use as NOEC in Special Condition, as TUc on DMR**

| | | | | | | |
|---|---|---|---|---|---|---|
| **CHRONIC** | **2.120733292 $TU_c$** | **NOEC =** | **48** | % Use as | **2.08** | **$TU_c$** |
| **BOTH*** | **4.290000105 $TU_c$** | **NOEC =** | **24** | % Use as | **4.16** | **$TU_c$** |
| **AML** | **2.120733292 $TU_c$** | **NOEC =** | **48** | % Use as | **2.08** | **$TU_c$** |

**ACUTE WLAa,c** **4.29** — Note: Inform the permittee that if the mean
**CHRONIC WLAc** **1.45** — of the data exceeds this TUc: **1.0**
* Both means acute expressed as chronic — a limit may result using WLA.EXE

**Enter data in the cells with blue type:**

| | |
|---|---|
| Entry Date: | 11/13/12 |
| Facility Name: | Surry Power Station and Gravel Neck |
| VPDES Number: | **VA0004090** |
| Outfall Number: | **001** |

**% Flow to be used from MIX.EXE**

| | | | |
|---|---|---|---|
| Plant Flow: | **2300** | MGD | |
| Acute 1Q10: | | MGD | % |
| Chronic 7Q10: | | MGD | % |

**Diffuser /modeling study?**

| | |
|---|---|
| Enter Y/N | **Y** |
| Acute | 1.43 :1 |
| Chronic | 1.45 :1 |

| | | | |
|---|---|---|---|
| Are data available to calculate CV? (Y/N) | **N** | (Minimum of 10 data points, same species, needed) | Go to Page 2 |
| Are data available to calculate ACR? (Y/N) | **N** | (NOEC<LC50, do not use greater/less than data) | Go to Page 3 |

| | | |
|---|---|---|
| $IWC_a$ | 69.93006993 % | Plant flow/plant flow + 1Q10 |
| $IWC_c$ | 68.96551724 % | Plant flow/plant flow + 7Q10 |

**NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use**

| | | |
|---|---|---|
| Dilution, acute | 1.43 | 100/IWCa |
| Dilution, chronic | 1.45 | 100/IWCc |
| $WLA_a$ | 0.429 | Instream criterion (0.3 TUa) X's Dilution, acute |
| $WLA_c$ | 1.45 | Instream criterion (1.0 TUc) X's Dilution, chronic |
| $WLA_{a,c}$ | 4.29 | ACR X's $WLA_a$ - converts acute WLA to chronic units |
| ACR -acute/chronic ratio | 10 | LC50/NOEC (Default is 10 - if data are available, use tables Page 3) |
| CV-Coefficient of variation | 0.6 | Default of 0.6 - if data are available, use tables Page 2) |
| Constants eA | 0.4109447 | Default = 0.41 |
| eB | 0.6010373 | Default = 0.60 |
| eC | 2.4334175 | Default = 2.43 |
| eD | 2.4334175 | Default = 2.43 (1 samp) |

No. of samples 1

**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $LTA_{a,c}$ | 1.762952763 | WLAa,c X's eA | | | | | |
| $LTA_c$ | 0.871504085 | WLAc X's eB | | | | Rounded NOEC's | % |
| MDL** with $LTA_{a,c}$ | 4.290000105 | $TU_c$ | NOEC = | 23.310023 | (Protects from acute/chronic toxicity) | NOEC = 24 | % |
| MDL** with $LTA_c$ | 2.120733292 | $TU_c$ | NOEC = | 47.153501 | (Protects from chronic toxicity) | NOEC = 48 | % |
| AML with lowest LTA | 2.120733292 | $TU_c$ | NOEC = | 47.153501 | Lowest LTA X's eD | NOEC = 48 | |

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM $TU_c$ to $TU_a$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | Rounded LC50's | % |
| MDL with $LTA_{a,c}$ | 0.429000011 | $TU_a$ | LC50 = | 233.100227 % | Use NOAEC=100% | LC50 = NA | % |
| MDL with $LTA_c$ | 0.212073329 | $TU_a$ | LC50 = | 471.535013 % | Use NOAEC=100% | LC50 = NA | |

## Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| IF YOU HAVE AT LEAST 10 DATA POINTS THAT | | | | Vertebrate | | | Invertebrate | |
| ARE QUANTIFIABLE (NOT "<" OR ">") | | | | $IC_{25}$ Data | | | $IC_{25}$ Data | |
| FOR A SPECIES, ENTER THE DATA IN EITHER | | | | or | | | or | |
| COLUMN "G" (VERTEBRATE) OR COLUMN | | | | $LC_{50}$ Data | LN of data | | $LC_{50}$ Data | LN of data |
| "J" (INVERTEBRATE). THE 'CV' WILL BE | | | | *********** | | | ************ | |
| PICKED UP FOR THE CALCULATIONS | | | 1 | | | 1 | 0 | |
| BELOW. THE DEFAULT VALUES FOR eA, | | | 2 | | | 2 | | |
| eB, AND eC WILL CHANGE IF THE 'CV' IS | | | 3 | | | 3 | | |
| ANYTHING OTHER THAN 0.6. | | | 4 | | | 4 | | |
| | | | 5 | | | 5 | | |
| | | | 6 | | | 6 | | |
| | | | 7 | | | 7 | | |
| Coefficient of Variation for effluent tests | | | 8 | | | 8 | | |
| | | | 9 | | | 9 | | |
| CV = | 0.6 | (Default 0.6) | 10 | | | 10 | | |
| | | | 11 | | | 11 | | |
| ð$^2$ = | 0.3074847 | | 12 | | | 12 | | |
| ð = | 0.554513029 | | 13 | | | 13 | | |
| | | | 14 | | | 14 | | |
| Using the log variance to develop eA | | | 15 | | | 15 | | |
| | (P. 100, step 2a of TSD) | | 16 | | | 16 | | |
| Z = 1.881 (97% probability stat from table | | | 17 | | | 17 | | |
| A = | -0.889296658 | | 18 | | | 18 | | |
| eA = | 0.410944686 | | 19 | | | 19 | | |
| | | | 20 | | | 20 | | |
| Using the log variance to develop eB | | | | | | | | |
| | (P. 100, step 2b of TSD) | | St Dev | NEED DATA | NEED DATA | St Dev | NEED DAT/ | NEED DATA |
| ð$_4^2$ = | 0.086177696 | | Mean | 0 | 0 | Mean | 0 | 0 |
| ð$_4$ = | 0.293560379 | | Variance | 0 | 0.000000 | Variance | 0 | 0.000000 |
| B = | -0.509098225 | | CV | 0 | | CV | 0 | |
| eB = | 0.601037335 | | | | | | | |
| | | | | | | | | |
| Using the log variance to develop eC | | | | | | | | |
| | (P. 100, step 4a of TSD) | | | | | | | |
| | | | | | | | | |
| ð$^2$ = | 0.3074847 | | | | | | | |
| ð = | 0.554513029 | | | | | | | |
| C = | 0.889296658 | | | | | | | |
| eC = | 2.433417525 | | | | | | | |
| | | | | | | | | |
| Using the log variance to develop eD | | | | | | | | |
| | (P. 100, step 4b of TSD) | | | | | | | |
| **n =** | **1** | This number will most likely stay as "1", for 1 sample/month. | | | | | | |
| ð$_n^2$ = | 0.3074847 | | | | | | | |
| ð$_n$ = | 0.554513029 | | | | | | | |
| D = | 0.889296658 | | | | | | | |
| eD = | 2.433417525 | | | | | | | |

## Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute $LC_{50}$, since the ACR divides the $LC_{50}$ by the NOEC. $LC_{50}$'s >100% should not be used.

**Table 1. ACR using Vertebrate data**

| Set # | $LC_{50}$ | NOEC | Test ACR | Logarithm | Geomean | Antilog | ACR to Use |
|---|---|---|---|---|---|---|---|
| 1 | | | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | 0 |
| 2 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| 3 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| 4 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| 5 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| 6 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| 7 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| 8 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| 9 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| 10 | #N/A | #N/A | #N/A | #N/A | #DIV/0! | #DIV/0! | 0 |
| | | | ACR for vertebrate data: | | | | 0 |

| | | |
|---|---|---|
| Table 1. Result: | Vertebrate ACR | 0 |
| Table 2. Result: | Invertebrate ACR | 25 |
| | Lowest ACR | 25 |

**Table 2. ACR using Invertebrate data**

| Set # | $LC_{50}$ | NOEC | Test ACR | Logarithm | Geomean | Antilog | ACR to Use |
|---|---|---|---|---|---|---|---|
| 1 | 50 | 2 | 25 | 3.2188758 | 3.218875825 | 25 | 25 |
| 2 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| 3 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| 4 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| 5 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| 6 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| 7 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| 8 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| 9 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| 10 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | NO DATA |
| | | | ACR for vertebrate data: | | | | 25 |

**Convert $LC_{50}$'s and NOEC's to Chronic TU's**

**for use in WLA.EXE**

**Table 3.** **ACR used: 10**

| | Enter $LC_{50}$ | TUc | Enter NOEC | TUc |
|---|---|---|---|---|
| 1 | | NO DATA | | NO DATA |
| 2 | | NO DATA | | NO DATA |
| 3 | | NO DATA | | NO DATA |
| 4 | | NO DATA | | NO DATA |
| 5 | | NO DATA | | NO DATA |
| 6 | | NO DATA | | NO DATA |
| 7 | | NO DATA | | NO DATA |
| 8 | | NO DATA | | NO DATA |
| 9 | | NO DATA | | NO DATA |
| 10 | | NO DATA | | NO DATA |
| 11 | | NO DATA | | NO DATA |
| 12 | | NO DATA | | NO DATA |
| 13 | | NO DATA | | NO DATA |
| 14 | | NO DATA | | NO DATA |
| 15 | | NO DATA | | NO DATA |
| 16 | | NO DATA | | NO DATA |
| 17 | | NO DATA | | NO DATA |
| 18 | | NO DATA | | NO DATA |
| 19 | | NO DATA | | NO DATA |
| 20 | | NO DATA | | NO DATA |

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50, enter it here:

| | | |
|---|---|---|
| enter it here: | NO DATA | $\%LC_{50}$ |
| | NO DATA | TUa |

**DILUTION SERIES TO RECOMMEND**

**Table 4.**

| | Monitoring % Effluent | Monitoring TUc | Limit % Effluent | Limit TUc |
|---|---|---|---|---|
| Dilution series based on data mean | 100 | 1.0 | | |
| Dilution series to use for limit | | | 48 | 2.0833333 |
| Dilution factor to recommend: | 0.5 | | 0.6928203 | |
| | | | | |
| Dilution series to recommend: | 100.0 | 1.00 | 100.0 | 1.00 |
| | 50.0 | 2.00 | 69.3 | 1.44 |
| | 25.0 | 4.00 | 48.0 | 2.08 |
| | 12.5 | 8.00 | 33.3 | 3.01 |
| | 6.25 | 16.00 | 23.0 | 4.34 |
| Extra dilutions if needed | 3.12 | 32.05 | 16.0 | 6.26 |
| | 1.56 | 64.10 | 11.1 | 9.04 |

**Cell:** I9
**Comment:**
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

**Cell:** K18
**Comment:** This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

**Cell:** J22
**Comment:** Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

**Cell:** C40
**Comment:**
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

**Cell:** C41
**Comment:** If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

**Cell:** L48
**Comment:**
See Row 151 for the appropriate dilution series to use for these NOEC's

**Cell:** G62
**Comment:**
Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

**Cell:** J62
**Comment:**
Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

**Cell:** C117
**Comment:** Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

**Cell:** M119
**Comment:** The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

**Cell:** M121
**Comment:** If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa. The calculation is the same: 100/NOEC = TUc or 100/LC50 = TUa.

**Cell:** C138
**Comment:** Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

## Attachment K

NPDES Permit Rating Worksheet

# NPDES PERMIT RATING WORK SHEET

► Regular Addition
☐ DiscretionaryAddition
☐ Score change, but no status change
☐ Deletion

NPDES NO. _VA0004090

Facility Name:_Surry Power Station and Gravel Neck

County/City:_Surry_________

Receiving Water:__James River (Lower)____

Reach Number: ________________________________

*Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?*

√ 1. Power output 500 MW or greater (not using a cooling pond/lake)

√ 2. A nuclear power plant

√ 3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

► YES; score is 600 (stop here) ☐ NO (continue)

*Is this permit for a municipal separate storm sewer serving a population greater than 100,000?*

☐ YES; score is 700 (stop here)
☐ NO (continue)

## FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _________ Primary SIC Code:_______ Other SIC Codes: _________
Industrial Subcategory Code: _________ (Code 000 if no subcategory)

*Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)*

| Toxicity Group | Code | Points | Toxicity Group | Code | Points | Toxicity Group | Code | Points |
|---|---|---|---|---|---|---|---|---|
| ☐ No process waste streams | 0 | 0 | ☐ 3. | 3 | 15 | ☐ 7. | 7 | 35 |
| ☐ 1. | 1 | 5 | ☐ 4. | 4 | 20 | ☐ 8. | 8 | 40 |
| ☐ 2. | 2 | 10 | ☐ 5. | 5 | 25 | ☐ 9. | 9 | 45 |
| | | | ☐ 6. | 6 | 30 | ☐ 10. | 10 | 50 |

Code Number Checked: ___0___

**Total Points Factor 1**: __0___

## FACTOR 2: Flow/Stream Flow Volume (*Complete either Section A or Section B; check only one)*

Section A ☐ Wastewater Flow Only Considered

| Wastewater Type (See Instructions) | | Code | Points |
|---|---|---|---|
| Type I: Flow < 5 MGD | ☐ | 11 | 0 |
| Flow 5 to 10 MGD | ☐ | 12 | 10 |
| Flow > 10 to 50 MGD | ☐ | 13 | 20 |
| Flow > 50 MGD | ☐ | 14 | 30 |
| Type II: Flow < 1 MGD | ☐ | 21 | 10 |
| Flow 1 to 5 MGD | ☐ | 22 | 20 |
| Flow > 5 to 10 MGD | ☐ | 23 | 30 |
| Flow > 10 MGD | ☐ | 24 | 50 |
| Type III: Flow < 1 MGD | ☐ | 31 | 0 |
| Flow 1 to 5 MGD | ☐ | 32 | 10 |
| Flow > 5 to 10 MGD | ☐ | 33 | 20 |
| Flow > 10 MGD | ☐ | 34 | 30 |

Section B ☐ Wastewater and Stream Flow Considered

| Wastewater Type (See Instructions) | Percent of instream Wastewater Concentration at Receiving Stream Low Flow | | Code | Points |
|---|---|---|---|---|
| Type I/III: | < 10 % | ☐ | 41 | 0 |
| | 10 % to < 50 % | ☐ | 42 | 10 |
| | > 50 % | ☐ | 43 | 20 |
| Type II: | < 10 % | ☐ | 51 | 0 |
| | 10 % to <50 % | ☐ | 52 | 20 |
| | > 50 % | ☐ | 53 | 30 |

Code Checked from Section A or B: __0___

**Total Points Factor 2:** __0____

**FACTOR 3: Conventional Pollutants**
*(only when limited by the permit)*

NPDES NO: VA0004090

A. Oxygen Demanding Pollutant: (check one) ☐ BOD ☐ COD ☐ Other: ______________________________

| | | *Code* | *Points* |
|---|---|---|---|
| Permit Limits: (check one) | ☐ < 100 lbs/day | 1 | 0 |
| | ☐ 100 to 1000 lbs/day | 2 | 5 |
| | ☐ > 1000 to 3000 lbs/day | 3 | 15 |
| | ☐ > 3000 lbs/day | 4 | 20 |

Code Checked: __NA__

**Points Scored**: ___0__

B. Total Suspended Solids (TSS)

| | | *Code* | *Points* |
|---|---|---|---|
| Permit Limits: (check one) | ☐ < 100 lbs/day | 1 | 0 |
| | ☐ 100 to 1000 lbs/day | 2 | 5 |
| | ☐ > 1000 to 5000 lbs/day | 3 | 15 |
| | ☐ > 5000 lbs/day | 4 | 20 |

Code Checked: __NA__

**Points Scored**: ___0___

C. Nitrogen Pollutant: (check one) ☐ Ammonia ☐ Other: ______________________________

| | *Nitrogen Equivalent* | *Code* | *Points* |
|---|---|---|---|
| Permit Limits: (check one) | ☐ < 300 lbs/day | 1 | 0 |
| | ☐ 300 to 1000 lbs/day | 2 | 5 |
| | ☐ > 1000 to 3000 lbs/day | 3 | 15 |
| | ☐ > 3000 lbs/day | 4 | 20 |

Code Checked: __NA__

**Points Scored**: ___0__

**Total Points Factor 3**: ___0__

## FACTOR 4: Public Health Impact

*Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.*

☐ YES (If yes, check toxicity potential number below)

☐ NO (If no, go to Factor 5)

Determine the *human health* toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the <u>human health</u> toxicity group column ☐ check one below)

| Toxicity Group | Code | Points | Toxicity Group | Code | Points | Toxicity Group | Code | Points |
|---|---|---|---|---|---|---|---|---|
| ☐ No process waste streams | 0 | 0 | ☐ 3. | 3 | 0 | ☐ 7. | 7 | 15 |
| ☐ 1. | 1 | 0 | ☐ 4. | 4 | 0 | ☐ 8. | 8 | 20 |
| ☐ 2. | 2 | 0 | ☐ 5. | 5 | 5 | ☐ 9. | 9 | 25 |
| | | | ☐ 6. | 6 | 10 | ☐ 10. | 10 | 30 |

Code Number Checked: __0___

**Total Points Factor 4**: ___0__

**FACTOR 5: Water Quality Factors** NPDES NO: VA0004090

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge:*

| | | Code | Points |
|---|---|---|---|
| ☐ | Yes | 1 | 10 |
| ☐ | No | 2 | 0 |

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

| | | Code | Points |
|---|---|---|---|
| ☐ | Yes | 1 | 0 |
| ☐ | No | 2 | 5 |

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

| | | Code | Points |
|---|---|---|---|
| ☐ | Yes | 1 | 10 |
| ☐ | No | 2 | 0 |

Code Number Checked: A _NA_ B _NA_ C _NA_

**Points Factor 5**: A _0_ + B _0_ + C _0_ = _0_ TOTAL

## FACTOR 6: Proximity to Near Coastal Waters

A. *Base Score: Enter flow code here (from Factor 2):* _NA_ *Enter the multiplication factor that corresponds to the flow code:* _NA_

Check appropriate facility HPRI Code (from PCS):

| | *HPRI#* | *Code* | *HPRI Score* | *Flow Code* | *Multiplication Factor* |
|---|---|---|---|---|---|
| ☐ | 1 | 1 | 20 | 11, 31, or 41 | 0.00 |
| ☐ | 2 | 2 | 0 | 12, 32, or 42 | 0.05 |
| ☐ | 3 | 3 | 30 | 13, 33, or 43 | 0.10 |
| ☐ | 4 | 4 | 0 | 14 or 34 | 0.15 |
| ☐ | 5 | 5 | 20 | 21 or 51 | 0.10 |
| | | | | 22 or 52 | 0.30 |
| | | | | 23 or 53 | 0.60 |
| | | | | 24 | 1.00 |

HPRI code checked: _3_

Base Score: (HPRI Score) _NA_ X (Multiplication Factor) _0_ = _0_ (TOTAL POINTS)

B. *Additional Points* □ *NEP Program*
*For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?*

| | | Code | Points |
|---|---|---|---|
| ☐ | Yes | 1 | 10 |
| ☐ | No | 2 | 0 |

C. *Additional Points* □ *Great Lakes Area of Concern*
*For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)*

| | | Code | Points |
|---|---|---|---|
| ☐ | Yes | 1 | 10 |
| ☐ | No | 2 | 0 |

Code Number Checked: A _NA_ B _NA_ C _N/A_

**Points Factor 6**: A _0_ + B _0_ + C _0_ = _0_ TOTAL

**SCORE SUMMARY**

NPDES NO: VA0004090

| Factor | Description | Total Points |
|---|---|---|
| 1 | Toxic Pollutant Potential | 0 |
| 2 | Flows/Streamflow Volume | 0 |
| 3 | Conventional Pollutants | 0 |
| 4 | Public Health Impacts | 0 |
| 5 | Water Quality Factors | 0 |
| 6 | Proximity to Near Coastal Waters | 0 |
| | TOTAL (Factors 1 through 6) | 600 |

S1. Is the total score equal to or greater than 80? ▶ Yes (Facility is a major) ☐ No

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☐ No

☐ Yes (Add 500 points to the above score and provide reason below:

Reason:

NEW SCORE: 600

OLD SCORE: 600

Jeremy Kazio
Permit Reviewer's Name

(804) 527-5044
Phone Number

August 28, 2012
Date

# Attachment L

VDH and DCR Concurrence

RECEIVED
NOV 20 2012
PRO

# COMMONWEALTH of VIRGINIA


DEPARTMENT OF HEALTH
**OFFICE OF DRINKING WATER**
Southeast Virginia Field Office

830 Southampton Avenue
Suite 2058
Norfolk, VA 23510
Phone (757) 683-2000
Fax (757) 683-2007


## MEMORANDUM

**TO:** Jeremy S. Kazio
Water Permit Writer
Department of Environmental Quality – Piedmont Regional Office

**DATE:** NOV 16 2012

**FROM:** Daniel B. Horne, P.E. DBH
Engineering Field Director

**CITY/COUNTY:** Surry

**PROJECT TYPE:** ☐ New ☑ Renewal or Revision

☑ VPDES ☐ VPA ☐ VWPP ☐ JPA ☐ Other: ____________

☑ Number: VA0004049

**OWNER/APPLICANT:** Virginia Electric & Power Company

**PROJECT:** Dominion Virginia Power Surry Power Station & Gravel Neck

☑ There are no public water supply raw water intakes located within 15 miles downstream or within one tidal cycle upstream of the existing project.

☐ The raw water intake for the __________ waterworks is located __________ miles [downstream/upstream] of the discharge. This should be a sufficient distance to minimize the impacts of the discharge. We recommend a minimum Reliability Class of ____ for this facility.

☐ The raw water intake for the ______________ waterworks is located __________ miles [downstream/upstream (within one tidal cycle)] of the discharge.

☐ Please forward a copy of the Draft Permit for our review and comment.

☐ Comments:

Prepared by: Kendra Hardy
Kendra Hardy
District Engineer

pc: V.D.H. - Office of Drinking Water, Field Services Engineer

R:\DIST19\Surry\GENERAL\Surry Power Station VPDES Nov2012.docx

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

MEMORANDUM

DATE: October 22, 2012

TO: Jeremy Kazio, DEQ-PRO

FROM: Alli Baird, DCR-DNH

SUBJECT: VA0004090, Surry Power Station & Gravel Neck Facility

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov). This project is located within 2 miles of documented occurrences of state listed animals. Therefore, DCR recommends coordination with VDGIF, Virginia's regulatory authority for the management and protection of these species to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Thank you for the opportunity to comment on this project.

Cc: Amy Ewing, VDGIF

# Attachment M

EPA Review Response

# Attachment N

5/27/2010 Application Waiver

**MEMORANDUM**

**DEPARTMENT OF ENVIRONMENTAL QUALITY**
***Piedmont Regional Office***

**4949-A Cox Road** **Glen Allen, VA 23060** **804/527-5020**

**SUBJECT**: Waiver Request for VA0004090 – Dominion VA Power – Surry/Gravel Neck

**TO**: Curtis Linderman – Water Permit Manager

**FROM**: Jeremy Kazio – Water Permit Writer

**DATE**: May 27, 2010

**COPIES**: File

The attached sampling plan and waiver request is from Dominion VA Power Surry/Gravel Neck, VA0004090. Please note that the permittee has asked for waivers from requirements which do not apply in some cases:

- Outfall 001 (2298.23 MGD) – Units 1 and 2 Condenser Cooling Water - No valid waiver is requested for this outfall.

- Outfall 002 (0.0196 MGD) – Gravel Neck Turbine Dike – This outfall consists of storm water runoff only from a diked area surrounding the gas turbine. Valid waiver requests are listed below. Other requests mentioned in the attachment are not valid or do not apply in the permittee's case.

  - Form 2C: Part V.A – Waive 24-hour composite sampling in lieu of grab samples
  - Form 2C: Part V.B - Waive 24-hour composite sampling in lieu of grab samples
  - Form 2C: Part V.C - Waive 24-hour composite sampling in lieu of grab samples
  - Attachment A - Waive 24-hour composite sampling in lieu of grab samples

- Internal Outfall 101 (design=0.085 MGD, actual=0.0326 MGD) – Sewage Treatment Plant: This internal outfall consists of treated municipal effluent flows from a sewage treatment facility serving employees. Treated municipal effluent comingles with condenser cooling water prior to discharge from Outfall 001. Valid waiver requests are listed below. Other requests mentioned in the attachment are not valid or do not apply in the permittee's case.

  - Form 2A: Section A.12 – Waive testing and reporting requirement for temperature.
  - Form 2C: Part V.B – Waive 24-hour composite sampling in lieu of grab samples.
  - Form 2C: Part V.C – Waive 24-hour composite sampling in lieu of grab samples.

- All other Internal Outfalls – Please see this memo's attachment for outfall descriptions.
  - Form 2C: Parts V.A, V.B, & V.C – Waive all testing requirements other than those parameters which are limited at these outfalls.

Recommendations:

Outfall 001
No waivers requested

Outfall 002
Form 2C requires 24-hour composite sampling for test parameters because industrial facilities have variable levels of effluent flow and quantity during a 24 hour period (typically higher production during the day, lower at night). 24-hour composite sample results provide DEQ with a better example of the "average" of each parameter discharged by each facility. However, in this case, effluent originates from a retention dike which collects storm water. The storm water is held within the dike until it can be observed/tested for petroleum residue. During the time that the storm water is being held for observation/testing, water from the beginning of the storm event is mixing with water at the end of the storm event. Therefore, a grab sample of the mixed storm water can be assumed to be representative of what a 24-hour composite sample would reflect for each parameter. I recommend waiving the 24-hour composite sampling requirement for those parameters noted in the attached document from the permittee.

All internal outfalls, including 101
DEQ does not currently provide guidance regarding required testing from internal outfalls for reissuance applications. With Dominion VA Power – Surry, this office has historically accepted test results for only those parameters which are limited by the permit. For the 2012 permit reissuance, the permittee has proposed that the same effluent screening strategy be used as in past reissuances. I agree with and recommend this approach.

---

☒ Approved ☐ Denied

Comments: As recommended, for this permit cycle only. Per the VPDES Permit Manual (GM 10-2003, Section II, page 5) in lieu of 24-hour composite samples, a minimum of 4 grab samples will be required.

Signature

June 3, 2010
Date

**Surry Power Station PermitVA0004090**
**Proposed Sampling Plan and Requested Waivers**



| Outfall | EPA Form | Parameters | Data Source To Be Used | Waiver Requested |
|---|---|---|---|---|
| **001 – Units 1 and 2 condenser cooling water** | 2C – Part V-A | Flow, pH,<br><br>Remaining Part V-A parameters | DMRs<br><br>Field sampling - 24 hr composite | -- |
| | 2C – Part V-B | Total phosphorus, TRC<br><br>All remaining Part V- B parameters<br><br>Fecal coliform, Sulfite | DMRs<br><br>Field sampling -24 hr composite and grab samples where required<br><br>Believed absent | --<br><br>--<br><br>No testing |
| | 2C – Part V-C | Dioxin<br><br>All applicable Part V-C parameters | Believed absent<br>Field sampling -24 hr composite and grab samples where required | No testing |
| | VA – WQS | Strontium90, Tritium, $H_2S$, Nitrate N, Chlorides, TDS, Pesticides/PCBs, and TBT will be collected using a 24hc sample. | Field sampling -24 hr composite | -- |

| Outfall | EPA Form | Parameters | Data Source To Be Used | Waiver Requested |
|---|---|---|---|---|
| **002 – Gravel Neck Turbine Dike** | 2C – Part V-A | Flow, pH, TSS, TOC<br><br>Remaining Part A parameters | DMRs<br><br>Field sampling – Grab | --<br><br>The retention time of the dike is > 24 hours, grab sample will be used to generate the data.<br><br>Waive 24-hr composite sampling requirement |
| | 2C – Part V-B | Fecal coliform, Sulfite<br><br>All remaining Part V-B parameters | Believed absent<br><br>Field sampling – Grab | No testing<br><br>Waive 24-hr composite sampling requirement |
| | 2C – Part V-C | Dioxin<br><br>All applicable Part V-C parameters | Believed absent<br><br>Field sampling – Grab | No testing<br><br>Waive 24-hr composite sampling requirement |
| | VA – WQS | Strontium90, Tritium, $H_2S$, Nitrate N, Chlorides, TDS, Pesticides/PCBs, and TBT will be collected using a 24hc sample. | Field sampling – Grab | Waive 24-hr composite sampling requirement |

**Surry Power Station PermitVA0004090**
**Proposed Sampling Plan and Requested Waivers**



| Outfall | EPA Form | Parameters | Data Source To Be Used | Waiver Requested |
|---|---|---|---|---|
| 101 – Sewage Treatment Plant (Internal Outfall) | Form 2A Section A.12 | Flow, pH, TSS, BOD5,TRC, Fecal coliform<br><br>Temperature (summer & winter) | DMRs | --<br><br>Waive testing requirement |
| | 2C – Part V-B | TRC<br><br>Sulfite<br><br>All Remaining Part V-B parameters | DMRs<br><br>Believed absent<br><br>Field sampling – Grab | --<br><br>No testing<br><br>Waive 24-hr composite sampling requirement |
| | 2C – Part V-C | Dioxin<br><br>All applicable Part V-C parameters (Total metals, CN, Total phenols) | Believed absent<br><br>Field sampling – Grab | No testing<br><br>Waive 24-hr composite sampling requirement |
| | Sludge Form Section A-8 | Section A-8 parameters | Not Applicable-No limits have been established for the list of Section A-8 Parameters | No testing |

| Outfall | EPA Form | Parameters | Data Source To Be Used | Waiver Requested |
|---|---|---|---|---|
| (Internal Outfalls)<br>104 Station Reverse Osmosis Reject & backwash<br>105 Station Oil Storage Tank Dike<br>107 Package Boiler<br>109 Rad-waste Facility<br>110 Unit 1A Waste Neutralization Sump<br>111 Unit 1B Waste Neutralization Sump<br>112 Unit 2A Waste Neutralization Sump<br>113 Unit 2B Waste Neutralization Sump<br>114 Unit 1 Steam Generator Blowdown<br>115 Unit 2 Steam Generator Blowdown<br>116 Unit 1 Recirculation Spray Heat Exchanger<br>117 Unit 2 Recirculation Spray Heat Exchanger<br>118 Unit 1 Condenser Hotwell Drain<br>119 Unit 2 Condenser Hotwell Drain<br>120 Low Conductivity Sump<br>121 Unit 1 Steam Generator Hydrolaser Trailer<br>122 Unit 2 Steam Generator Hydrolaser Trailer | 2C – Part V-A,<br>2C – Part V-B, and<br>2C – Part V-C<br>parameters | Flow<br>pH<br>TSS<br>Oil and Grease<br>TPH (Outfall 105 only) | DMRs | --<br><br>Waive testing requirement for the remaining Part V-A, Part V-B and Part V-C parameters |

**Surry Power Station PermitVA0004090**
**Proposed Sampling Plan and Requested Waivers**



| **Outfall** | **EPA Form** | **Parameters** | **Data Source To Be Used** | **Waiver Requested** |
|---|---|---|---|---|
| (Internal Outfalls)<br><br>**102 – Turbine Building Sump A**<br>**103 – Turbine Building Sump B**<br>**106 – Turbine Building Sump C** | 2C – Part V-A,<br>2C – Part V-B, and<br>2C – Part V-C parameters | Flow<br>pH<br>TSS<br>Oil and Grease | DMRs | --<br><br>Waive testing requirement for the remaining Part V-A, Part V-B and Part V-C parameters |

| **Outfall** | **EPA Form** | **Parameters** | **Data Source To Be Used** | **Waiver Requested** |
|---|---|---|---|---|
| (Internal Outfall)<br><br>**108 – Settling Pond** | 2C – Part V-A,<br>2C – Part V-B, and<br>2C – Part V-C parameters | Flow,<br>pH,<br>TSS,<br>TOC<br>Oil and Grease | DMRs | --<br><br>Waive testing requirement for the remaining Part V-A, Part V-B and Part V-C parameters |